

Glast Front End Processor User's Guide

Integrated Test & Operations System (ITOS)

GFEP Setup & Software Configuration

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ITOS Development & Support Group

NASA/GSFC Code 584, Greenbelt MD 20771

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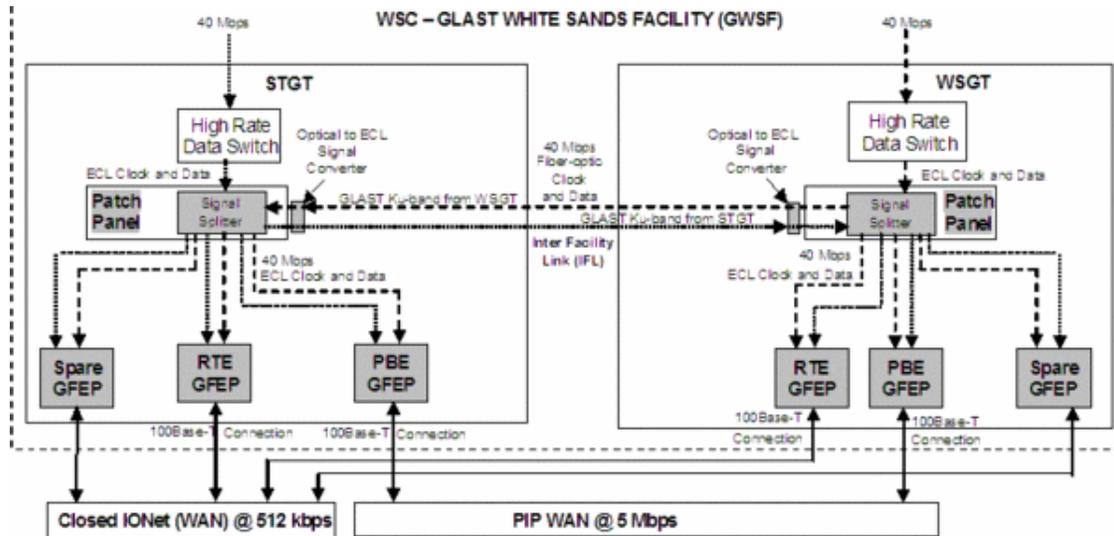
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Glast Front End Processor Overview

This is a the Glast Front End Processors (GFEP) software user's guide and does not cover hardware maintenance and operations. For this information refer to the Glast Front End Processor O&M manual (581.M-UG-0001).

1 Introduction

The Glast Front End Processors (GFEP) are a set of 2 racks at the White Sands TDRSS Ground Stations WSGT and STGT. Each rack contains one Real Time Element (RTE), one PlayBack Element (PBE) and one spare.



Each GFEP is identical in hardware but different in configuration.

- The RTE computer will always be connected to the Closed IONet limited to 512Kbps bandwidth.
- The PBE computer will always be connected to the PIP WAN network limited to 10Mbps bandwidth.
- The spare computer will be configured as an RTE and be connected to the Closed IONet, but can be re-configured as a PBE and connected to the PIP WAN manually by White Sands support personnel.

The RTE's function is to send real time telemetry data to the Mission Operations Control center (MOC) during a pass while the PBE's function is to send stored frame archives to the MOC after a pass ends. The spare computer will be functional but not operational as an active spare so it can be managed and updated by the MOC and quickly reconfigured as operational when required.

Since there are two antenna systems at White Sands, one GFEP rack is located at each antenna site with it's own independent network and data connections. An intersite fiber link exists to cross-link the two sites GFEPs telemetry data to back each other up during support. Thus each GFEP has two telemetry inputs, one from each ground station system. Only one antenna site will be actively receiving a downlink from the Glast spacecraft at any one time. At no time, even during testing, will WSGT and STGT be receiving concurrent downlinks. Should the GFEPs receive a downlink on both channels, each GFEP will pick the first receiver from which it detects clock at the beginning of each pass.

2 Configuring the GFEP

The following chapter lays out the steps necessary to configure a Supermicro computer as a runtime GFEP. These procedures are not designed for a novice computer user and assume advanced knowledge of computer bios setup, operating systems installation and system administration.

2.1 Supplied Media

The GFEP installation consists of the following controlled disks required to complete system installation and configuration:

- Red Hat Enterprise Linux 3 update 5 (WS I386) - 4 install CDs
- Red Hat Enterprise Linux 3 CD 8 - Documentation CD
- EDT PCI 3.3.4 - Software installation CD (EDT Driver Disk)
- Adaptec RAID Installation CD
- GFEP Extra Install CD - including kernel-2.4.1-32.0.1 update
- GFEP/RedHat Kickstart Configuration floppy diskette

2.2 Bios Setup

- Power on GFEP
- Press the key to enter bios setup
- Main Menu
 - Set time and date
- Advanced Menu
 - Boot Features
 - Power button Behavior [4-sec Override]
 - Summary Screen [Disable]
 - Memory Cache
 - Discrete MTRR Allocation [Disable]
 - Advanced Chipset Control
 - SERR Signal condition [multiple bit]
 - Advanced Processor Options
 - Hyper-threading [disable]
- Hardware Monitor Logic
 - Fan speed control mode [2] Optimized Server 3-pin
- Exit
 - Exit Saving Changes <Enter>

system reboots

2.3 Adaptec Raid Setup

- Power on GFEP
- Press <Ctl-a> keys when displayed
- Wait for Raid Setup utility to run
- Press <Alt-r> Create
 - Press <Enter> on first 7 drives (0,0) to (0,6)
 - Press <Tab> <Enter>
- Press <Alt-a> Action
 - Press <Alt-m> Make Hotspare
 - select (0,0,9,0)
- Press <Alt-f> Set System Config

raid rebuild will start, wait for build to complete
- Press <Alt-f> Exit

system reboots

2.4 RedHat EL3 Install

- Power on GFEP
- Insert RedHat Enterprise Update 5 (disk 1) in CD drive
- When the system prompt BOOT appears, insert the RedHat Kickstart floppy in floppy drive and type:


```
linux ks=floppy
```
- Press <Enter>
- System will start automated install

User will be prompted when to change between disks. At completion, last disk will eject and system will reboot.

The root account will be created with the password encrypted on the floppy disk and written on the label.
- Remove CD
- Eject and remove floppy diskette (*before system reboots*)

2.5 First RedHat boot

- License Agreement


```
Select ‘‘Yes, I agree’’
```
- Date & Time


```
Set date and time to current GMT
Do not enable NTP yet
```
- User Account

Do not add user account now

- RedHat Network

Select ‘‘No, I don’t want to register my system’’

- Additional CDs

Install optional Documentation disk - RHEL 3 CD8

Select only ‘‘English’’ documentation

Click on ‘‘details’’ and select all boxes except the 2 that refer to ‘‘IBM eServer iSeries’’ and ‘‘IBM s/390’’

Click on ‘‘Close’’

Click on ‘‘Forward’’

After install completes click ‘‘Finish’’

- Remove ‘‘Documentation disk - RHEL 3 CD8’’ from CD drive

- Login as root using supplied password

```
ln -s /usr/bin/perl /usr/local/bin/perl
```

- Insert ‘‘GFEP Extra Install CD’’ in CD drive

```
mount /dev/cdrom
```

```
cd /root
```

```
cp -rp /mnt/cdrom/root/* .
```

```
umount /dev/cdrom
```

- Remove ‘‘GFEP Extra Install CD’’ from CD drive

2.6 Install Additional Root Packages

- cd /root

- Install kernel-2.4.21-32.0.1 patch

```
rpm -Uvh kernel-*.rpm
```

- Install openmotif21-2.1.30-8 package

```
rpm -Uvh openmotif21-2.1.30-8.i386.rpm
```

- Install Sun Java 1.4.2_05 package

```
rpm -Uvh j2sdk-1_4_2_05-linux-i586.rpm
```

```
cd /usr/java
```

```
mv j2sdk1.4.2_05 ..
```

```
cd ..
```

```
rmdir java
```

```
ln -s j2sdk1.4.2_05 java
```

- Reboot the system then continue with Section 2.7 [Install FastCopy 2.6], page 6.

```
reboot
```

System Reboots

2.7 Install FastCopy 2.6

- cd /root
- Create Work directory and Uncompress package


```
uncompress fc26.linuxrhEL.Z
mkdir fltmp
cd fltmp
tar xvf ../fc26.linuxrhEL
./install
```
- Run Install script user interaction


```
enter you activation key:
FASTCopy-full-evaluation-2.6-03fe5fc3 "or key supplied by Omitron"
Please enter root directory for FASTCopy software [/usr/flogic] : <enter>
Please enter a directory for the symbolic links to the executables
(should be in your PATH) [/usr/bin] : <enter>
Please enter a directory for the libraries [/usr/lib] : <enter>
Please enter a directory for the examples [/usr/flogic/examples] : <enter>
Please enter a directory for include files [/usr/flogic/include] : <enter>
Please enter a directory for the man pages [/usr/man/man1] : <enter>
Would you like to backup existing files [yes] ? no <enter>
Would you like FASTCopy daemon to be started by 'inetd' [no] ? <enter>
Would you like FASTCopy daemon to be started by 'xinetd' [yes] ? <enter>
Please enter port number for FASTCopy? 40000<enter>
Is the above information correct (YES / NO / QUIT) ? yes <enter>
```

NOTE: The above scenario will complete but the verify will fail

```
touch /usr/flogic/cycle_count
cd /root/fcopy-lic
```

```
For gfep1 type "cd gfep1"
For gfep2 type "cd gfep2"
For gfep3 type "cd gfep_bkup1"
For gfep4 type "cd gfep3"
For gfep5 type "cd gfep4"
For gfep6 type "cd gfep_bkup2"
```

```
cp -f lic_fastcopy.sl /usr/flogic
```

NOTE: The licenses for gfep3 and gfep6 are only temporary backup and expire on 4/03 every year and must be updated before that date by the MOC or FASTCopy will not function.

```
cd root
cp -pf fcopyshr /usr/flogic/bin
cp flogicd /etc/init.d
```

```
chkconfig --add floglcd
/sbin/service xinetd restart
/sbin/service floglcd start
```

2.8 Security Banners

- Install the NASA security warning banners to the LOGIN screen

```
cd /root/Banners
./install-banner.csh
```

2.9 Network Setup

The GFEPs are configured to run in one of two modes, RTE or PBE.

As an RTE, the GFEP connected to the Closed IONet must initiate all network connections to less secure networks.

As a PBE, the GFEP connected to the PIP WAN is less secure than the MOC, so the GFEP acts as a server to allow the MOC to initiate the socket connects. One caveat to this is FASTCopy. Data transfers by the PBE to the MOC via FASTCopy are initiated by the GFEP and must be encrypted for security requirements.

For added security 'ipfilter' program is configured to only allow access to the appropriate MOC computers. This filter file is supplied for each GFEP and the contents can be found in Appendix A [GFEP System Files], page 29, under item Section A.8 [Ipfilter Configuration file], page 34.

The 'redhat-config-network' program was used to configure the network profiles used to control whether the GFEP is configured as an RTE or a PBE. To reduce the setup time these profiles are loaded from the 'GFEP Extra Install CD' during installation of Section 2.11 [Miscellaneous /etc files], page 9 and their creation will not be discussed in this document. This configuration creates 3 profiles for the MOC to use. They are

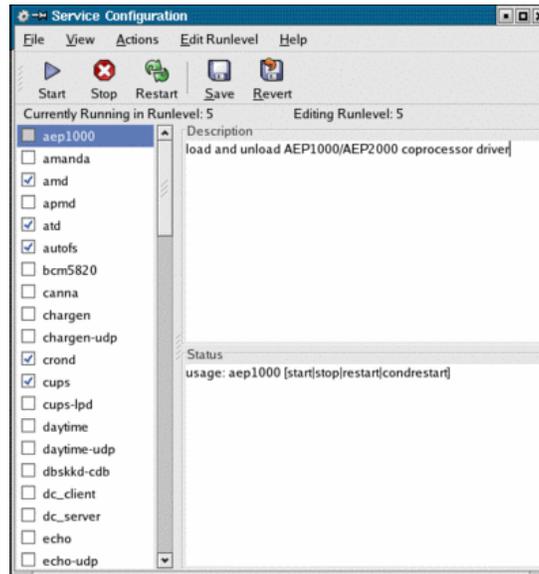
- default - configures the system for localhost only and not used in operations.
- ionet - configures the system for the Closed IONet as an RTE.
- pipwan - configures the system for the PIP WAN as a PBE.
- bld25 - if present was used for testing at GSFC and is not for operations.

Not all GFEPs will have both IONet and PIPWAN profiles depending on the job that particular computer is defined to do. When and how to change what profile is loaded is controlled by the 'redhat-config-network-cmd' program which will be discussed in the Chapter 3 [Running the GFEP], page 17 section.

See Section A.9 [Network Devices/Profiles], page 35 for the layout and actual contents of the network configuration files.

2.10 System Services

- Run RedHat Configuration program
 - From the xterm window type “/usr/bin/redhat-config-services & <enter>”



NOTE: Unclick and stop all services except the following which should be clicked and started

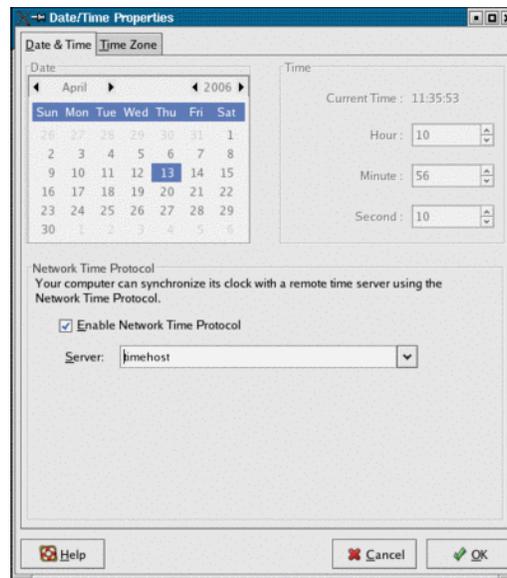
```

atd
anacron [if it exists]
crond
fcopyd
flogid
iptables
irqbalance
kudzu
microcode_ctl
network
ntpd
portmap
random
rawdevices
sshd
syslog
xinetd

```

- Click on “Save” button
- Click on File->Quit
- Setup Network Time Daemon (NTP)

- From the xterm window type “/usr/bin/redhat-config-date & <enter>”



- When the “Date/Time Properties” window opens, then
 - Click on “Enable Network Time Protocol” box
 - Click into the “Server:” box and enter time host name or IP address, .i.e “timehost”
 - Click on “OK” box

2.11 Miscellaneous ‘/etc’ files

From the xterm window type the following:

- `cd /root`
- `cp -pf motd /etc`
- `cp -pf sudoers /etc`
- `chmod 440 /etc/sudoers`

NOTE: This allows gfep & glast users extra root commands such as:

At the GFEP console the user can shutdown the computer by typing
`sudo /sbin/shutdown -h now`

At the GFEP console or remotely gfep or glast user can reboot by typing
`sudo /sbin/reboot`

These and more will be discussed in the Chapter 3 [Running the GFEP], page 17 section.

- `cp -pf sysctl.conf /etc`
- `/sbin/sysctl -p`
- `cd gfeps`

```

For gfep1 type "cd gfep1"
For gfep2 type "cd gfep2"
For gfep3 type "cd gfep3"
For gfep4 type "cd gfep4"
For gfep5 type "cd gfep5"
For gfep6 type "cd gfep6"

```

- `cp -prf etc/* /etc`
"This copies all network specific system files and overrides to Section A.7 [Daily Cron Jobs], page 33 to the '/etc' directory tree"
- Activate the appropriate network profile selecting the correct command below:
 - [for an RTE]*
`redhat-config-network-cmd -profile ionet -activate`
 - [for a PBE]*
`redhat-config-network-cmd -profile pipwan -activate`

2.12 SSH Modifications

From the xterm window type "emacs /etc/ssh/sshd_config & <enter>"

```

$OpenBSD: sshd_config,v 1.59 2002/09/25 11:17:16 markus Exp $
# This is the sshd server system-wide configuration file. See
# sshd_config(8) for more information.
# This sshd was compiled with PATH=/usr/local/bin:/bin:/usr/bin
# The strategy used for options in the default sshd_config shipped with
# OpenSSH is to specify options with their default value where
# possible, but leave them commented. Uncommented options change a
# default value.
#Port 22
#Protocol 2.1
#ListenAddress 0.0.0.0
#ListenAddress ::
# HostKey for protocol version 1
#HostKey /etc/ssh/ssh_host_key
# HostKeys for protocol version 2
#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_dsa_key
# Lifetime and size of ephemeral version 1 server key
#KeyRegenerationInterval 3600
#ServerKeyBits 768
# Logging
#obsoletes QuietMode and FascistLogging
#SyslogFacility AUTH
#SyslogFacility AUTHPRIV
#LogLevel INFO
# Authentication:
#LoginGraceTime 120
#PermitRootLogin no
#StrictModes yes
#RSAAuthentication yes
#PubkeyAuthentication yes
#AuthorizedKeysFile .ssh/authorized_keys
# hosts authentication should not be used
#HostAuthentication no
-- sshd_config 12:37PM 0.04 (text file) - 57 - top

```

Find the line ‘‘#Protocol 2,1’’ and edit it to become
 ‘‘Protocol 2’’

Find the line ‘‘#PermitRootLogin yes’’ and edit it to become
 ‘‘PermitRootLogin no’’

Press <Ctl-x><Ctl-c>

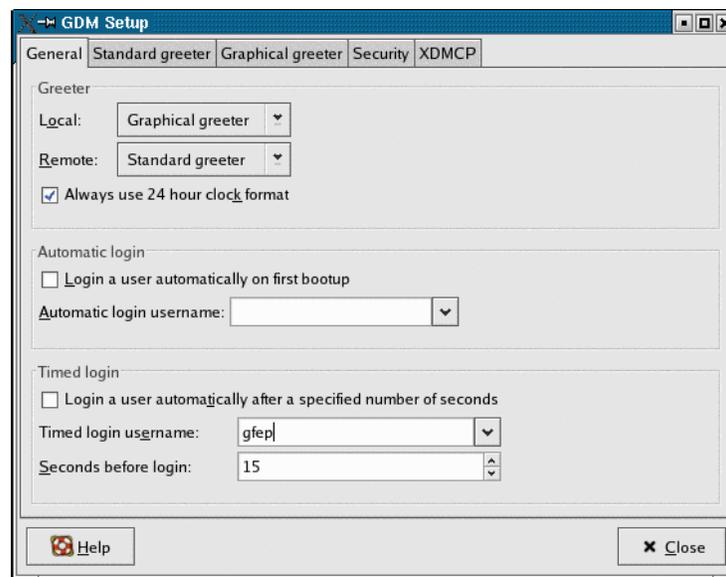
Type ‘‘y’’

```
/usr/sbin/service sshd restart
```

2.13 Create User Accounts

From the xterm window do the following:

```
groupadd -g 500 glast
useradd -D -g 500
useradd -m -c"glast moc" -g 500 -u 500 glast
useradd -m -c"gfep runtime" -g 500 -u 501 gfep
useradd -m -c"ITOS software" -g 500 -u 1279 -s /sbin/nologin itos
passwd glast
<you will be prompted for glast password here>
passwd gfep
<you will be prompted for gfep password here>
passwd itos
<you will be prompted for itos password here>
cd /home
chmod g+ws gfep itos
chmod +rx gfep itos glast
gdmsetup &
```



When the ‘GDM Setup’ window opens, click on "General" tab.
 Click on "Always use 24 hour clock format" box.
 Under "Timed login" section,
 Click on "Login a user after a specified number of seconds" box.
 In the "Timed login username" box, Enter "gfep".
 In the "Seconds before login" box, Enter "15".

Click on the "Security" tab.
 Unclick the "Allow root to login remotely with GDM".
 Click "Close" box.

2.14 RAID Utilities Install

From the xterm window do the following:

```
Insert ‘Adaptec RAID Installation CD’ in CD drive
mount /dev/cdrom
cd /mnt/cdrom/packages/Linux/apps/sm
rpm -Uvh dptapps-3.32-1.i386.rpm
cd /root
umount /dev/cdrom
Remove ‘RAID Installation CD’ from CD drive
/usr/dpt/raidutil -L raid
```

You should see the raid status displayed

2.15 EDT Driver/Software Install

WARNING: All kernel updates must be installed and the system rebooted before installing the EDT drivers.

Insert “EDT Driver disk” in CD drive

From the xterm window do the following:

```
mount /dev/cdrom
/mnt/cdrom/linux.go
Click on ‘Install EDT Software’ box
Click ‘CD’ box
Click ‘OK’ on popup Target Directory ‘/opt/EDTpcd’
Watch ‘Installation Window’ and click ‘OK’ when install complete
Click ‘Quit’ to close ‘EDT Software for Linux’ window
/umount /dev/cdrom
cd /opt/EDTpcd
cp -p /root/dualin.sh .
cp -p /root/dot.run_pcdload .run_pcdload
cp -p /root/pcdload .
./edtinit restart
```

Remove “EDT Driver disk” from CD drive

2.16 ITOS Install

Insert “Extra GFEP Install Disk” in CD drive

From the xterm window do the following:

```
mount /dev/cdrom
su glast
cd ~itos
cp -p /mnt/cdrom/itos/* .
tar -zxf itos_7-3_i386-RedHatEL-v3.tar.gz
tar -zxf Patch_01_i386-RHEL-3.tar.gz
tar -zxf Patch_02_i386-RHEL-3.tar.gz
tar -zxf Patch_03_i386-RHEL-3.tar.gz
tar -zxf Patch_04_i386-RHEL-3.tar.gz
tar -zxf Patch_05_i386-RHEL-3.tar.gz
tar -zxf Patch_06_i386-RHEL-3.tar.gz
rm lib/libedt.so
exit
umount /dev/cdrom
```

Remove “Extra GFEP Install Disk” from CD drive

2.17 GFEP Home Directory Install

Insert “Extra GFEP Install Disk” in CD drive mount /dev/cdrom

From the xterm window do the following:

```
su gfep
cd ~gfep
cp -pr /mnt/cdrom/gfep/* .
rm -rf TRANS.TBL
chmod 664 dot.bash_logout dot.bash_profile dot.bashrc
chmod 600 dot.netrc
chmod 774 dot.Xdefaults
mv dot.bash_logout .bash_logout
mv dot.bash_profile .bash_profile
mv dot.bashrc .bashrc
mv dot.netrc .netrc
mv dot.Xdefaults .Xdefaults
. .bashrc
```

To copy the appropriate itosrc.? file to Section B.1.6 [itosrc], page 41, select one of the following:

For gfep1 type “cp itosrc.1.ionet itosrc”
For gfep2 type “cp itosrc.2.pipwan itosrc”

```

For gfep3 type "cp itosrc.3.ionet itosrc"
For gfep4 type "cp itosrc.4.ionet itosrc"
For gfep5 type "cp itosrc.5.pipwan itosrc"
For gfep6 type "cp itosrc.6.ionet itosrc"

```

```

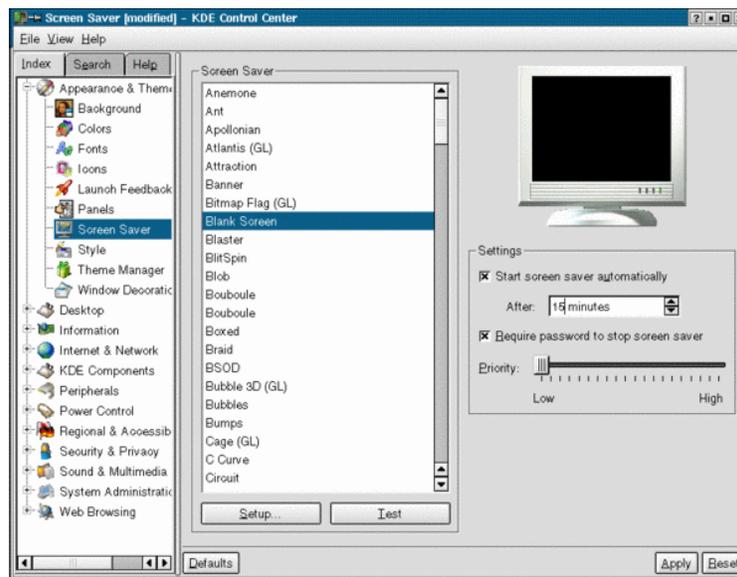
mkdir -p odb
./makedb
exit
umount /dev/cdrom

```

Remove "GFEP Extra Install Disk" from CD drive

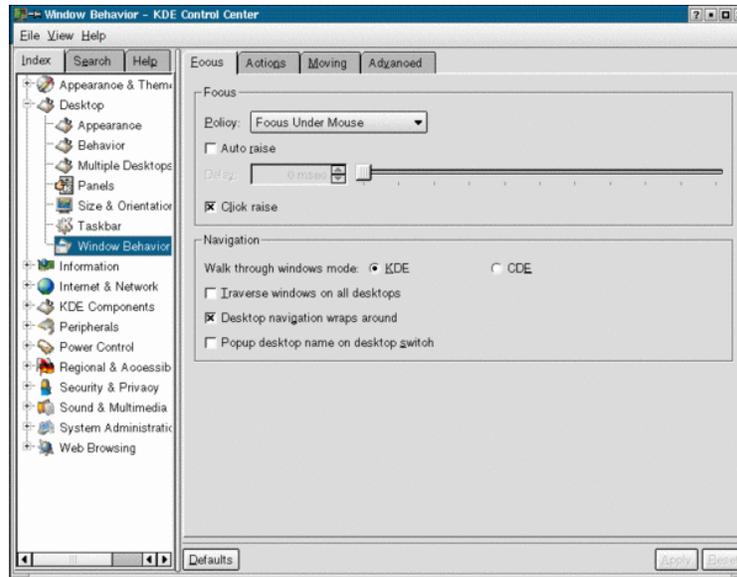
2.18 GFEP User KDE Configure

- If not at login screen, logout by press <Ctrl><Alt> keys together.
- At the login screen, left click on "Session" at the bottom of the screen and then click on "KDE" button.
- In the username window, enter "gfep" and press <Enter>
- Once logged in, bring up a console window if one isn't already open.
- Type "kcontrol &"

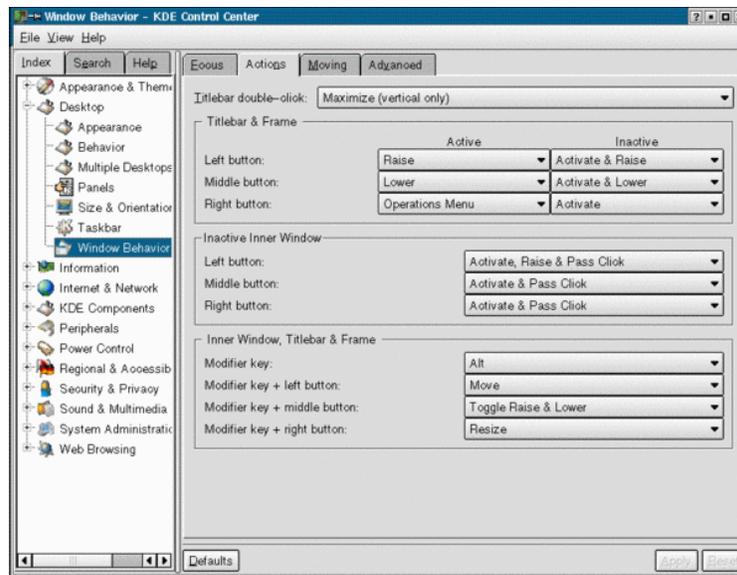


- In the Control Center left window, click on "Appearance & Themes"
- Click on "Screen Saver"
- Click on "Blank Screen" in Screen Saver panel.
- Under Settings, click the "Start screen saver automatically" box.
- Enter "15 minutes" in the "After" box.

- Click on the “Requires password to stop screen saver” box.
- Click the “Apply” button at the bottom of the window.



- In the Control Center left window, click on “Desktop”.
- Click on “Windows Behavior”.
- In the right section of the window, click on the "Focus" tab.
- In the “Focus” panel under “Policy”, click on the pull-down. and select “Focus Under Mouse”



- In the “Actions” panel click the “Titlebar double-click” pull down and select “Maximize (vertical only)”.
- Click the “Apply” button at the bottom of the window.
- Click the "X" box in the upper right corner of the window to exit.

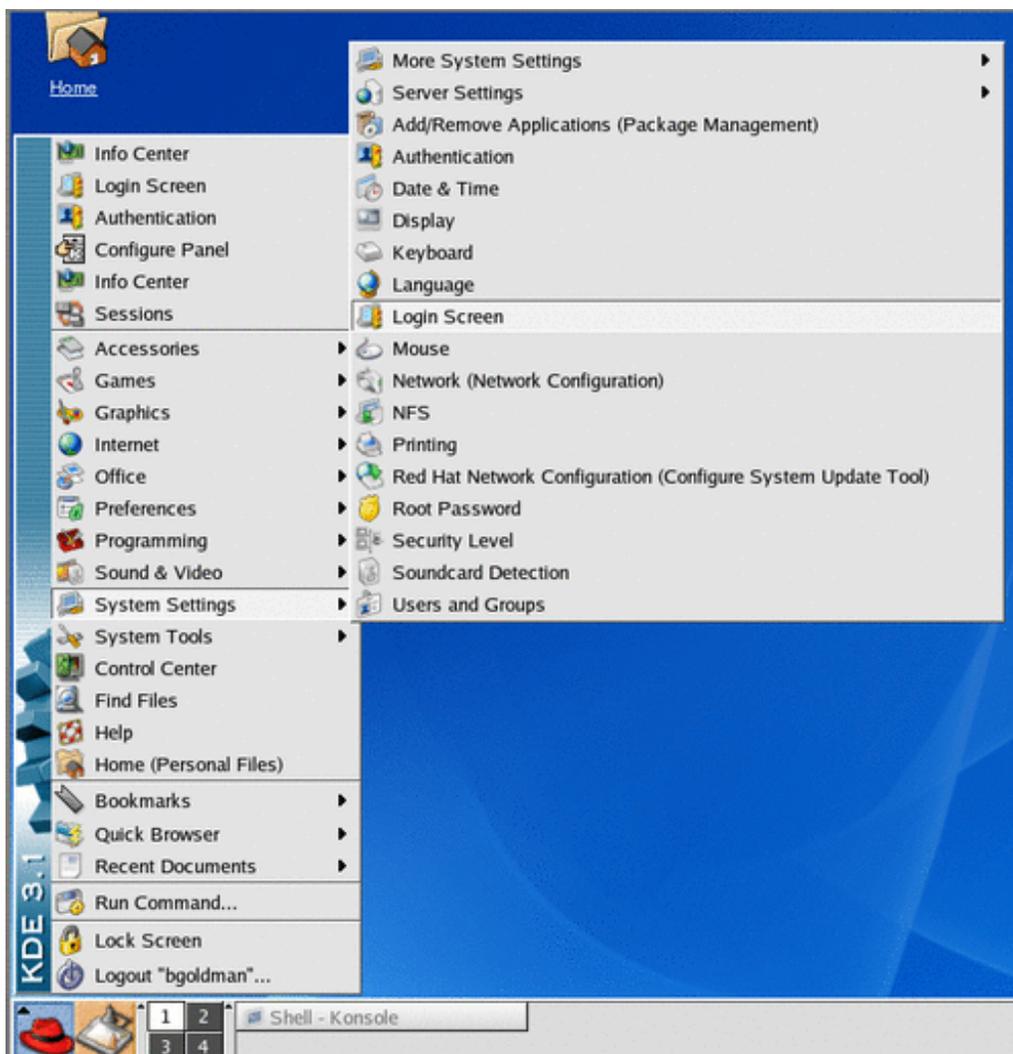
3.2.1 Local System Maintenance

The following are functions that can be performed by the White Sands operations personnel at the GFEP under the direction of the MOC

- System Power ON
 - Press the red power button on the right front panel of the GFEP computer and the power should come on.
 - The system will automatically boot up and come to the login screen.
 - If this is not an offline spare then the system will automatically log in and start ITOS after 15 seconds.
- System Power OFF
 - Press the red power button on the right front panel of the GFEP computer and hold it in for at least 4 seconds until the power goes off.
 - You will hear the cooling fans speed increase just before the power goes off.
- Local System Shutdown
 - At the console, select the appropriate button on the keyboard/monitor for the desired GFEP.
 - If the screen is blank, move the cursor ball around until the screen saver login appears.
 - Enter the GFEP or ROOT password to unlock the screen saver.
 - Left click the mouse in the white xterm window in the middle left screen as seen in the figure Section 3.1 [Normal Operations], page 17.
 - Type “sudo /sbin/shutdown -h now”
 - The screen will begin shutting down services and will eventually show it is safe to power off.
 - Follow the “System Power OFF” procedure.
- Local System Reboot
 - At the console, select the appropriate button on the keyboard/monitor for the desired GFEP.
 - If the screen is blank, move the cursor ball around until the screen saver login appears.
 - Enter the GFEP or ROOT password to unlock the screen saver.
 - Left click the mouse in the white xterm window in the middle left screen as seen in the figure in Section 3.1 [Normal Operations], page 17.
 - Type “sudo /sbin/reboot”
 - The screen will begin shutting down services and will eventually reboot and begin the power on cycle.
 - The system will automatically boot up and come to the login screen.
 - If this is not an offline spare, then the system will automatically log in and start ITOS after 15 seconds.

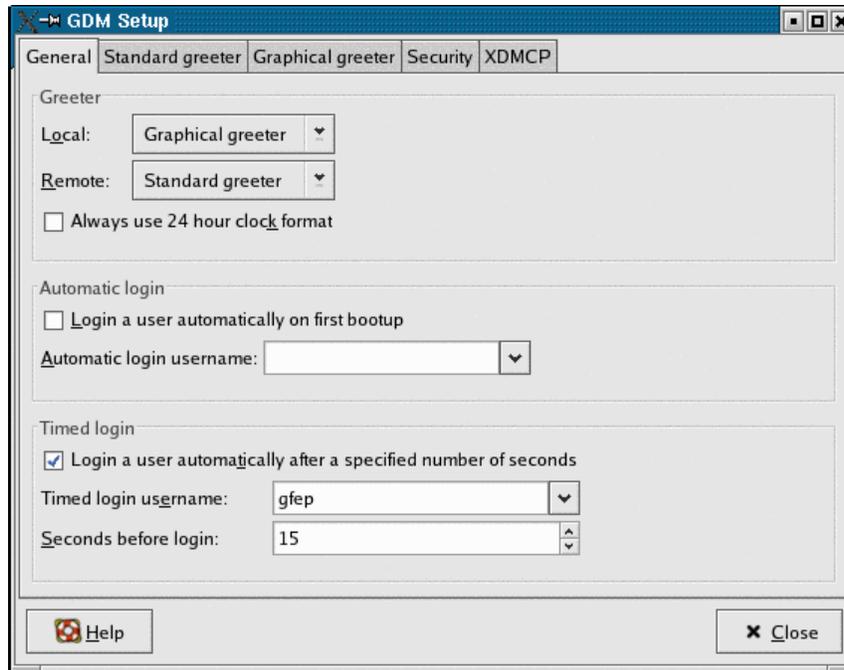
3.2.2 Local Enable Spare GFEP for Operation

- At the console, select the appropriate button on the keyboard/monitor for the desired GFEP.
- If the screen is blank, move the cursor ball around until the screen saver login appears.
- At the login screen, enter “root” as the user name.
- Enter the root password
- Once the login completes, left click on the Redhat icon at the bottom left of the screen as shown below.



- Left click on “System Settings”, then Left click on “login Screen”

- The GDM Setup window appears as shown below:



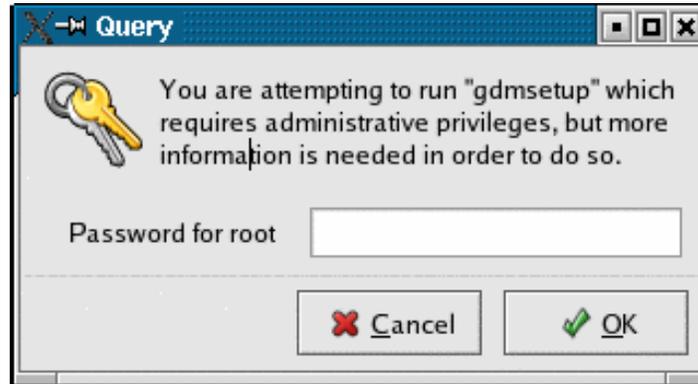
- In the "Timed login" section, Click on "Login a user after a specified number of seconds" box
- In the "Timed login username" box, enter "gfep"
- In the "Seconds before login" box, enter "15"
- Click the "Close" button.
- Press <Ctrl><Alt> keys together
- When "End Session GFEP" box appears, click on "Logout" button.

3.2.3 Local Disable a GFEP from Operation

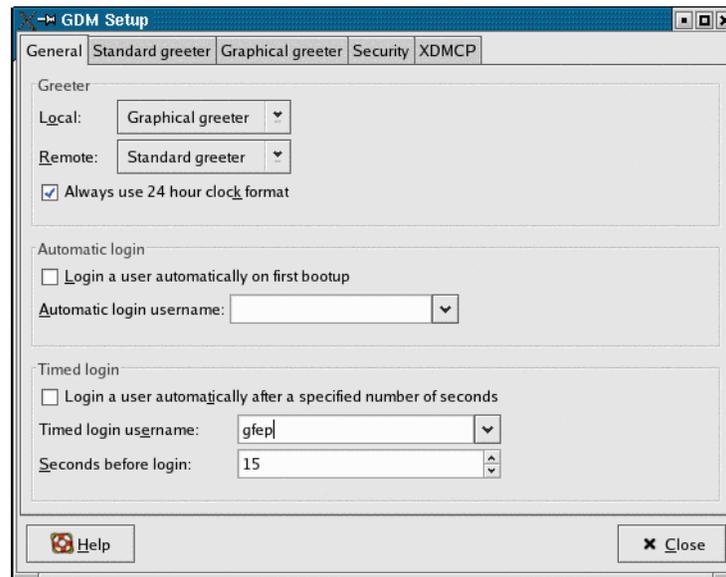
The following requires the GFEP to be logged in and running ITOS.

- At the console, select the appropriate button on the keyboard/monitor for the desired GFEP.
- If the screen is blank, move the cursor ball around until the screen saver login appears.
- Enter the GFEP or ROOT password to unlock the screen saver.
- Left click the mouse in the white xterm window in the middle left screen as seen in Section 3.1 [Normal Operations], page 17.

- Type “gdmsetup &”



- When the Query window above appears, enter the root password



When the GDM Setup window above appears

- In the "Timed login" section Unclick on "Login a user automatically after a specified number of seconds" box
- Click the "Close" button.
- Press <Ctrl><Alt> keys together
- When “End Session GFEP” box appears, click on “Logout” button.

3.2.4 Local Changing a GFEP Operating Mode

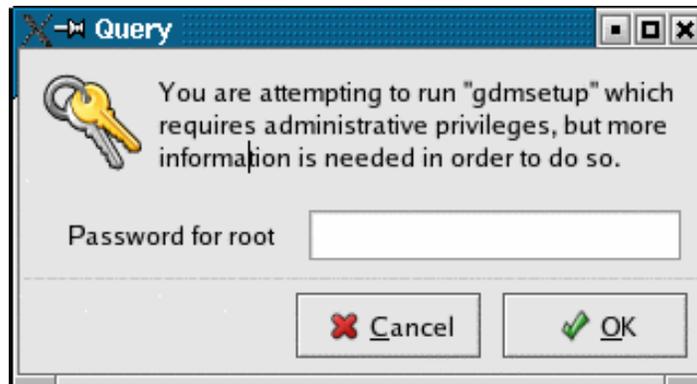
The GFEP runs in one of two modes, Realtime(RTE) or Playback(PBE). Each GFEP is identical in hardware but different in configuration.

- The RTE computer will always be connected to the Closed IONet limited to 512Kbps bandwidth.
- The PBE computer will always be connected to the PIP WAN network limited to 10Mbps bandwidth.

To change a GFEP from one mode to the other requires the White Sands support personnel to change the network connection into the computer ethernet port. The White Sands support personnel should refer to section 2.6 (Ethernet Patching) in the Glast Front End Processor O&M manual (581.M-UG-0001).

The following is the procedure to locally reconfigure a spare GFEP from RTE to PBE or PBE to RTE. This assumes that the GFEP is logged in as user GFEP.

- Before a computer that was previously connected to the PIPWAN can be connected to the Closed IONet it must first be security scanned.
- At the console, select the appropriate button on the keyboard/monitor for the desired GFEP.
- If the screen is blank, move the cursor ball around until the screen saver login appears.
- Enter the GFEP user or ROOT password to unlock the screen saver.
- Left click the mouse in the white xterm window in the middle left screen as seen in the figure in the Section 3.1 [Normal Operations], page 17 which you will use to type the following.
- `cd /home/gfep`
- `~/itos/bin/cleanup + evtforward`
“This will shut down ITOS on the GFEP”
- To reconfigure as an RTE install the correct Section B.1.6 [itosrc], page 41
For gfep3 type “cp itosrc.3.ionet itosrc”
For gfep6 type “cp itosrc.6.ionet itosrc”
`redhat-config-network-cmd --profile ionet --activate`
- To reconfigure as a PBE install the correct Section B.1.6 [itosrc], page 41
For gfep3 type “cp itosrc.3.pipwan itosrc”
For gfep6 type “cp itosrc.6.pipwan itosrc”
`redhat-config-network-cmd --profile pipwan --activate`



- When the security Query window above appears, enter the ROOT password.
- Network connection will be lost at this point.
- The White Sands person must unplug the ethernet cable from the 'E0' ethernet jack on the back of the GFEP being reconfigured and replace it with the appropriate ethernet cable from under the GFEP rack for the other network.
- su root
"You will be prompted for the root password to enter"
- service ntpd restart
"This will restart the NTP daemon "
- exit
- Press <Ctrl><Alt> keys together.
- When "End Session GFEP" box appears, click on "Logout" button.
- The system will logout and then log back in automatically.

3.3 Remote Maintenance & Reconfiguration

The following are methods of reconfiguring the GFEP from the MOC via secure shell (SSH).

The MOC can only ssh to the RTEs on the Closed IONet from the MOC Control Element (MCE).

The MOC can only ssh to the PBEs on the PIP WAN from one of the MOC ITOS Test Conductor Workstations (TCW).

3.3.1 System Maintenance

There are times when the MOC must perform remote maintenance on the GFEPs such as modifying port access lists, operating system patches or ITOS software patches. The MOC must gain access to a GFEP via a Secure Shell (SSH) session. It is not the intention of this section to discuss the workings of SSH or how to install patches. The MOC operations personnel responsible for upgrading the ITOS workstations have knowledge of this process. The following are examples of how to gain access to the GFEP and a few common maintenance tasks.

- System Access
 - From the MOC use the appropriate computer to SSH into the GFEP you desire to shut down using
 "ssh glast@hostname" where 'hostname' is replaced with the desired GFEP hostname or IP address.
 - When prompted, enter the glast password.
 - If access is denied, this workstation is not listed for port 22 access in the Section A.8 [Ipfilter Configuration file], page 34. The MOC may augment or modify this file from what was delivered with the system by SSH'ing into this GFEP from a workstation authorized in the configuration file and adding the new workstation

IP address.

Likewise, if other MOC workstations (such as backup MOC workstation) need access to the GFEP other operations ports, they will have to be added here as well.

Rules for controlling modification and validation of this file are out of scope of this document and must be directed to the project level.

- System Shutdown
 - This function is not recommended remotely and should be done locally by White Sands personnel. See Section 3.2.1 [Local System Maintenance], page 18.
- System Reboot
 - Follow the above procedure for “System Access”
 - Type “sudo /sbin/reboot”
 - The screen will begin shutting down services and will eventually reboot and begin the power on cycle.
 - The MOC will immediately lose contact with the GFEP once the operating system starts to recycle.
 - It will take a couple of minutes for the system to recycle and come back to where it will communicate again with the outside world.
- Changing Passwords

Since the Operating System was created with a set of predefined accounts and passwords, the MOC will probably need to change them regularly for security reasons. When ever this is performed, the MOC will have to contact the White Sands personnel and send them a new emergency list of users and passwords to be kept in the local safe accessible by the shift supervisor for emergencies.

 - Follow the above procedure for “System Access”
 - sudo passwd <user> “*where <user> is the account to change*”
 - You will be prompted by sudo for the last password
 - You will be prompted for the new <user> password
 - You will be prompted to repeat the new password
 - Password is changed.
 - Type “exit” .

3.3.2 Enable Spare GFEP for Operation

The spare GFEP computers are configured as an RTE by default or a PBE. To change the GFEP functionality as an RTE or PBE see Section 3.3.4 [Changing a GFEP Operating Mode], page 26. The spare GFEPs do not auto login. If due to failure it becomes necessary to enable a spare GFEP, the MOC must remotely log in from the MOC Control Element (MCE) for an RTE or MOC Test Conductor Workstation (TCW) for a PBE and perform the following:

- ssh glast@<hostname> where ‘hostname’ is replaced with the desired GFEP hostname or IP address.
“When prompted, enter the glast password.”
- sudo emacs -nw /etc/X11/gdm/gdm.conf
- Arrow down the screen until you reach the following lines

```
TimedLoginEnable=false
TimedLogin=??
TimedLoginDelay=??
```
- Replace with the following text:

```
TimedLoginEnable=true
TimedLogin=gfep
TimedLoginDelay=15
```
- To save file and exit, press <Ctrl x><Ctrl c> then type “y”
- /usr/sbin/gdm_restart
*“This will force the X server to restart which will logout the current user and the system will auto login the gfep user.
It will take about 60 seconds for the GFEP to start communicating with the MOC workstation.”*
- Type “exit”, then press <Enter>.
“This will log you out of the GFEP”

3.3.3 Disable a GFEP for Operation

If the spare GFEP computer has been changed to operational, it may become necessary to disable that GFEP and turn it back to a spare. If this is an RTE then the MOC must remotely log in from the MCE otherwise if this is an PBE the MOC must remotely log into the GFEP from one of the MOC Test Conductor Workstations computers. Then do the following:

- ssh glast@<gfep hostname> where ‘hostname’ is replaced with the desired GFEP hostname or IP address.
“When prompted, enter the glast password.”
- sudo emacs -nw /etc/X11/gdm/gdm.conf
- Arrow down the screen until you reach the following line

```
TimedLoginEnable=true
```
- Replace with the following text:

```
TimedLoginEnable=false
```
- To save file and exit, press <Ctrl x><Ctrl c> then type “y”
- su gfep
“You will be prompted for the gfep user password to enter”
- ~itos/bin/cleanup + evtforward
“This will shut down ITOS on the GFEP”
- exit

- `sudo /usr/sbin/gdp-restart`
*“You will be prompted for the glast user password to enter
This will cause the X server to restart and logout the console”*
- Type “exit” then press <Enter>.
“This will log you out of the GFEP”

3.3.4 Changing a GFEP Operating Mode

The GFEP runs in one of two modes, Realtime(RTE) or Playback(PBE). Each GFEP is identical in hardware but different in configuration.

- The RTE computer will always be connected to the Closed IONet limited to 512Kbps bandwidth.
- The PBE computer will always be connected to the PIP WAN network limited to 10Mbps bandwidth.

To change a GFEP from one mode to the other requires assistance from the White Sands support personnel to change the network connection into the computer ethernet port. The White Sands support personnel should refer to section 2.6 (Ethernet Patching) in the Glast Front End Processor O&M manual (581.M-UG-0001).

The following is the procedure to remotely reconfigure a spare GFEP from RTE to PBE or PBE to RTE

- ssh from a MOC computer to the GFEP via “ssh glast@hostname” where ‘hostname’ is the GFEP hostname or IP address.
“Enter the password when prompted.”
- If this GFEP is going to become operational, follow the procedures in Section 3.3.2 [Enable Spare GFEP], page 24. If this GFEP is going to become non operational, follow the procedures in Section 3.3.3 [Disable a GFEP], page 25, then proceed.
- `cd /home/gfep`
- To reconfigure as an RTE install the correct Section B.1.6 [itosrc], page 41
For gfep3 type “cp itosrc.3.ionet itosrc”
For gfep6 type “cp itosrc.6.ionet itosrc”
`sudo redhat-config-network-cmd --profile ionet --activate`
- To reconfigure as a PBE install the correct Section B.1.6 [itosrc], page 41
For gfep3 type “cp itosrc.3.pipwan itosrc”
For gfep6 type “cp itosrc.6.pipwan itosrc”
`sudo redhat-config-network-cmd --profile pipwan --activate`
- Network connection will be lost at this point.
- Have the White Sands person unplug the ethernet cable from the ‘E0’ ethernet jack on the back of the GFEP being reconfigured and replace it with the appropriate ethernet cable from under the GFEP rack for the other network.
- From a MOC workstation, ssh back into this GFEP, but now use the hostname or IP address appropriate for the new network configuration.

- Don't forget that you will have to change MOC workstations to do this since you are now on a different network.
- `sudo /usr/sbin/gdp-restart`
*"You will be prompted for the glast user password to enter
This will cause the X server to restart and logout the console"*
- Have the White Sands personnel verify that the GFEP screen goes blank and then the login screen appears.
- Type "exit" and press <Enter>.
"This will log you out of the GFEP"

3.3.5 Manual Network Change GUI

Should it become necessary that the MOC perform maintenance on the network configurations, the Network Configuration tool can be used to edit the network profiles all at once. If this is a GFEP on the Closed IONet, the network transfer rate will be very slow so expect delays in window update and interaction.

NOTE: *It is very important to take extreme care in modifying the network configuration because you could lock yourself out of any further access to this host and the host from the network.*

- `ssh` from a MOC computer to the GFEP via "`ssh glast@hostname`" where 'hostname' is the GFEP hostname or IP address.
"Enter the password when prompted."
- `redhat-config-network &`
"This will start the Network Configuration GUI"
- Select the profile to modify if not the current one by clicking on "Profile" at the stop of the window.
- Select the appropriate tab for the area to modify.
- Once in the selected tab, select the item to change and change it.
- If you changed profiles above, reselect the original profile.
- Click on the "File" at the top left of the window, then click on "Save" followed by "Quit".
- Type "exit" and press <Enter>.
"This will log you out of the GFEP"

4 Troubleshooting

TBD

Appendix A GFEP System Files supplied

The following files found on the “GFEP Extra Install Disk”

A.1 Floppy Kickstart Configuration file ‘ks.cfg’

The ‘ks.cfg’ file exists in the ‘/root’ directory and is copied to the Kickstart floppy disk.

The following is contents of the ‘ks.cfg’ file.

```
#Generated by Kickstart Configurator

#System language
lang en_US
#Language modules to install
langsupport --default=en_US
#System keyboard
keyboard us
#System mouse
mouse --emulthree genericps/2
#System timezone
timezone --utc America/New_York
#Root password
rootpw --iscrypted $1$Tmc.DFbc$SQ1x7QArUim1VroQCDf62/
#Reboot after installation
reboot
#Install Red Hat Linux instead of upgrade
install
#Use CDROM installation media
cdrom
#System bootloader configuration
bootloader --location=mbr --append hdc=ide-scsi
#Clear the Master Boot Record
zerombr yes
#Partition clearing information
clearpart --all --initlabel
#Disk partitioning information
part /boot --fstype ext3 --size 100 --ondisk sda
part / --fstype ext3 --size 10000 --ondisk sda
part swap --recommended --ondisk sda
part /home --fstype ext2 --size 1 --grow --ondisk sda
#System authorization information
auth --useshadow --enablemd5 --enablecache
#Network information
network --bootproto=dhcp --device=eth0
#Firewall configuration
firewall --enabled --trust=eth0 --ssh
```

```
#XWindows configuration information
xconfig --depth=16 --resolution=1280x1024 --defaultdesktop=KDE \
--startxonboot --monitor="LCD Panel 1280x1024"
#Run the Setup Agent on first boot
firstboot --enable
#Package install information
%packages --resolvedeps
X Window System
GNOME Desktop Environment
KDE Desktop Environment
Editors
Engineering and Scientific
Graphical Internet
Text-based Internet
Office/Productivity
Sound and Video
Graphics
Games and Entertainment
Authoring and Publishing
Development Tools
Kernel Development
X Software Development
GNOME Software Development
KDE Software Development
Administration Tools
System Tools
```

A.2 “Message of the Day” file ‘/etc/motd’

The following is contents of the ‘/etc/motd’ file

```
U.S. GOVERNMENT COMPUTER
If not authorized to access this system, disconnect now.

YOU SHOULD HAVE NO EXPECTATION OF PRIVACY
By continuing, you consent to your keystrokes and data content being monitored.
```

A.3 SU root allow file ‘/etc/sudoers’

The following is contents of the ‘/etc/sudoers’ file

```
# sudoers file.
#
# This file MUST be edited with the 'visudo' command as root.
#
# See the sudoers man page for the details on how to write a sudoers file.
#
```

```

# Host alias specification

# User alias specification

# Cmnd alias specification

# Defaults specification

# User privilege specification
root ALL=(ALL) ALL

# Uncomment to allow people in group wheel to run all commands
# %wheel ALL=(ALL) ALL

# Same thing without a password
# %wheel          ALL=(ALL)          NOPASSWD: ALL

# Samples
# %users  ALL=/sbin/mount /cdrom,/sbin/umount /cdrom

%glast localhost=/sbin/shutdown -h now
%glast  ALL=NOPASSWD: /sbin/reboot

gfep ALL=NOPASSWD: /usr/dpt/raidutil -L *
glast ALL=(ALL) ALL

```

A.4 Kernel System Control file ‘/etc/sysctl.conf’

The following is contents of the ‘/etc/sysctl.conf’ file.

```

# Kernel sysctl configuration file for Red Hat Linux
#
# For binary values, 0 is disabled, 1 is enabled.  See sysctl(8) and
# sysctl.conf(5) for more details.

# Controls IP packet forwarding
net.ipv4.ip_forward = 0

# Controls source route verification
net.ipv4.conf.default.rp_filter = 1

# Controls the System Request debugging functionality of the kernel
kernel.sysrq = 1

# Controls whether core dumps will append the PID to the core filename.
# Useful for debugging multi-threaded applications.
kernel.core_uses_pid = 1

```

```
# Controls added by recommendation of RedHat technician 8/22/2005
vm.inactive_clean_percent = 100
vm.bdflush = 50 256 0 0 500 3000 75 25 0
vm.max-readahead = 256
vm.min-readahead = 256
vm.pagecache = 1 15 30
```

A.5 FASTCopy flogic daemon file '/etc/init.d/flogicd'

The following is contents of the '/etc/init.d/flogicd' file.

```
#!/bin/bash
#
# Init file for flogic server daemon
#
# chkconfig: 5 99 99
# description: flogic server daemon
#
# processname: flogicd
# pidfile: /usr/flogic/flogic.pid

# source function library
. /etc/rc.d/init.d/functions

prog="flogicd"
RETVAL=0
FLOGICD=/usr/bin/flogicd

case "$1" in
  start)
    echo -n $"Starting $prog:"
      $FLOGICD
    RETVAL=$?
    ;;
  stop)
    echo -n $"Stopping $prog:"
      $FLOGICD -kill
    RETVAL=$?
    ;;
  restart)
    echo -n $"Restarting $prog:"
      $FLOGICD -kill; $FLOGICD
    RETVAL=$?
    ;;
  status)
    status $FLOGICD
    RETVAL=$?
    ;;
  *)
    ;;
esac
```

```

*)
echo $"Usage: $0 start|stop|restart"
RETVAL=1
esac

exit $RETVAL

```

A.6 EDT Additional files

The following are files added to the EDT configuration files in '/opt/EDTpcd' directory.

- EDT Configuration file '/opt/EDTpcd/.run_pcdload' read by 'edtinit' is
 - EDT Configuration load file '/opt/EDTpcd/pcdload' executed by '/etc/init.d/edtinit'.
- This file supercedes 'dualin.sh' which is no longer used.

```

#!/bin/sh

cd /opt/EDTpcd
export PATH=$PATH:/opt/EDTpcd

#The following extracted from /opt/EDTpcd/sse_dualin.sh
#Will set up two DMA channels to read two streams of data simultaneously

#Load the interface Xilinx (an XC4036XLA) on the main board.
bitload -u 0 ssebii.bit

#Load the XC2S100 Xilinx on the daughterboard
echo "xlf bitfiles/XC2S100/ssetii.bit" > sseload.pdb

#Configure the ECL logic for both channels in
echo "spal 011000" >>sseload.pdb

#Run the debugger, executing the commands accumulated in the file sseload.pdb
ssepdb -u 0 sseload.pdb

```

A.7 Daily Cron Jobs

The RedHat operating system can run daily tasks at regular interval to do chores such as removing temporary files and rotating log files. One such file is '/etc/cron.daily/tmpwatch'. This script normally removes files that have not been accessed in a defined period of time from '/tmp' and '/var/tmp' directories and others. The entries for cleaning out these 2 directories must be commented out to stop cron from removing the active pid files, fifos and itos odb files while ITOS is running. Since ITOS runs for a very long time and some files don't appear to be accessed, cron could try to delete these which would be catastrophic. The following is what tmpwatch should look like:

```

/usr/sbin/tmpwatch 240 /tmp
/usr/sbin/tmpwatch 720 /var/tmp
for d in /var/cache/man,catman/cat?,X11R6/cat?,local/cat?; do
    if [ -d "$d" ]; then
/usr/sbin/tmpwatch -f 720 $d
    fi
done

```

A.8 Ipfiler Configuration file ‘/etc/sysconfig/iptables’

This file defines what hosts are allowed access to what GFEP port services. There are six different versions of the file, one for each GFEP. The ‘x’ is replaced by the GFEP number 1 through 6.

- Port 22 is used for SSH daemon to allow remote secure shell access.
- Port 40000 is used by the FASTCopy program.
- Ports 620x0, 620x1, and 620x2 are used by ITOS to communicate real time telemetry, status and allow STOL control.
- Port 620x3 is reserved for future use.

NOTE: For security reasons most of the MOC IP addresses are obscured with yyy. The actual files contain the real addresses.

```

# Firewall configuration written by redhat-config-securitylevel
# Manual customization of this file is not recommended.
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
:RH-Firewall-1-INPUT - [0:0]
-A INPUT -j RH-Firewall-1-INPUT
-A FORWARD -j RH-Firewall-1-INPUT
-A RH-Firewall-1-INPUT -i lo -j ACCEPT
-A RH-Firewall-1-INPUT -p icmp --icmp-type any -j ACCEPT
-A RH-Firewall-1-INPUT -p 50 -j ACCEPT
-A RH-Firewall-1-INPUT -p 51 -j ACCEPT
-A RH-Firewall-1-INPUT -m state --state ESTABLISHED,RELATED -j ACCEPT
#-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 22 \
-j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.58 -m state --state NEW -m tcp -p \
tcp --dport 40000 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.58 -m state --state NEW -m tcp -p \
tcp --dport 620x0 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.58 -m state --state NEW -m tcp -p \
tcp --dport 620x1 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.58 -m state --state NEW -m tcp -p \
tcp --dport 620x2 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.58 -m state --state NEW -m tcp -p \

```

```

tcp --dport 22 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.59 -m state --state NEW -m tcp -p \
tcp --dport 40000 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.59 -m state --state NEW -m tcp -p \
tcp --dport 620x0 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.59 -m state --state NEW -m tcp -p \
tcp --dport 620x1 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.59 -m state --state NEW -m tcp -p \
tcp --dport 620x2 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.91.59 -m state --state NEW -m tcp -p \
tcp --dport 22 -j ACCEPT
-A RH-Firewall-1-INPUT -s yyy.yyy.154.158 -m state --state NEW -m tcp -p \
tcp --dport 22 -j ACCEPT
-A RH-Firewall-1-INPUT -j REJECT --reject-with icmp-host-prohibited
COMMIT

```

A.9 Network Devices/Profiles

The RedHat operating system allows for managing network configurations by what are called *PROFILES*. These profiles consist of a group of files within the `/etc/sysconfig/networking/` directory tree. The *DEVICES* directory contains the ethernet device specific files and the *PROFILES* directory contains the profile specific ethernet parameters necessary to setup the network as an RTE or PBE.

A.9.1 Devices directory

`/etc/sysconfig/networking/devices/` subdirectory contains files for each of the ethernet devices and pseudo devices. The GFEPs contain 2 ethernet devices *eth0* and *eth1*. Only variants of *eth0* are used. *eth1* is disabled.

NOTE: In the following file examples, parts of the real IP addresses have been replaced by `'xxx'` due to security reasons. The actual file contains the real addresses.

- `'ifcfg-eth0'` file contains

```

DEVICE=eth0
BOOTPROTO=none
ONBOOT=yes
TYPE=Ethernet
USERCTL=no
PEERDNS=yes

```

- `'ifcfg-eth0_ionet'` file contains

```

# Please read /usr/share/doc/initscripts-*/sysconfig.txt
# for the documentation of these parameters.
TYPE=Ethernet
DEVICE=eth0
BOOTPROTO=none
ONBOOT=yes

```

```

USERCTL=no
PEERDNS=yes
NETMASK=255.255.255.240
IPADDR=xxx.xxx.173.213
GATEWAY=xxx.xxx.173.209
ETHTOOL_OPTS="speed 100 duplex full autoneg off"

```

- 'ifcfg-eth0_pipwan' file contains

```

# Please read /usr/share/doc/initscripts-*/sysconfig.txt
# for the documentation of these parameters.
ONBOOT=yes
USERCTL=no
PEERDNS=yes
TYPE=Ethernet
DEVICE=eth0
BOOTPROTO=none
NETMASK=255.255.255.0
IPADDR=xxx.xxx.86.13
GATEWAY=xxx.xxx.86.1
ETHTOOL_OPTS="speed 100 duplex full autoneg off"

```
- 'ifcfg-eth1' file contains

```

DEVICE=eth1
BOOTPROTO=none
ONBOOT=no
TYPE=Ethernet

```

A.9.2 Profiles directory

The '/etc/sysconfig/networking/profiles' directory contains the individual network profiles for GFEP operation. There are basically 2 profiles for GFEP operations, IONET and PIPWAN. The IONET profile is used for the RTE configuration while the PIPWAN profile is used for the PBE configuration.

NOTE: In the following file examples, parts of the real IP addresses have been replaced by 'xxx' due to security reasons. The actual file contains the real addresses. In the following examples, a '?' is used to represent the GFEP number which would be 1 through 6. This is to keep from having to list 6 variants of the same file.

'/etc/sysconfig/networking/profiles' directory

- '/etc/sysconfig/networking/default' directory
 - 'hosts' file contains

```

# Do not remove the following line, or various programs
# that require network functionality will fail.
127.0.0.1 glastfep? localhost

```
 - 'network' file contains

```

HOSTNAME=glastfep?

```
 - 'resolv.conf' file contains

- <empty>
- ‘/etc/sysconfig/networking/ionet’ directory
 - ‘hosts’ file contains


```
127.0.0.1 glastfep? localhost
xxx.xxx.154.158 glastmcel
xxx.xxx.91.59 glastops2
xxx.xxx.91.58 glastops1
xxx.xxx.41.38 timehost
xxx.xxx.40.38 timehost1
```
 - ‘ifcfg-eth0_ionet’ file contains


```
# Please read /usr/share/doc/initscripts-*/sysconfig.txt
# for the documentation of these parameters.
TYPE=Ethernet
DEVICE=eth0
BOOTPROTO=none
ONBOOT=yes
USERCTL=no
PEERDNS=yes
NETMASK=255.255.255.240
IPADDR=xxx.xxx.176.140
GATEWAY=xxx.xxx.176.131
ETHTOOL_OPTS="speed 100 duplex full autoneg off"
```
 - ‘network’ file contains


```
HOSTNAME=glastfep?
```
 - ‘resolv.conf’ file contains


```
search xxxx.nasa.gov
```
 - ‘/etc/sysconfig/networking/pipwan’ directory
 - ‘hosts’ file contains


```
127.0.0.1 glastfep? localhost
xxx.xxx.91.58 glastops1
xxx.xxx.91.59 glastops2
xxx.xxx.244.18 timehost
```
 - ‘ifcfg-eth0_pipwan’ file contains


```
# Please read /usr/share/doc/initscripts-*/sysconfig.txt
# for the documentation of these parameters.
TYPE=Ethernet
DEVICE=eth0
BOOTPROTO=none
ONBOOT=yes
USERCTL=no
PEERDNS=yes
NETMASK=255.255.255.0
IPADDR=xxx.xxx.86.11
GATEWAY=xxx.xxx.86.1
```

- ```
ETHTOOL_OPTS="speed 100 duplex full autoneg off"
```
- 'network' file contains

```
HOSTNAME=glastfep?
```
  - 'resolv.conf' file contains

```
nameserver xxx.xxx.111.6
nameserver xxx.xxx.141.10
search xxxx.nasa.gov
```

## Appendix B GFEP User Files

The GFEP user directory ‘/home/gfep’ contains the configuration files and directories necessary to run ITOS as a Glast Front End Processor. These are as follows:

### B.1 gfep directory

The GFEP home directory contains a group of initialization files used by the Bash shell at system login and logout, the ITOS startup files and test scripts and programs used for system checkout and verification.

#### B.1.1 Bash Initialization file

‘/home/gfep/.bashrc’

```
.bashrc
ulimit -c unlimited

User specific aliases and functions

Source global definitions
if [-f /etc/bashrc]; then
. /etc/bashrc
fi
umask 002
export ITOS_MISSION=glast_fep
export ITOS_GROUP=gfep
export ITOS_OUTPUTDIR=~/output
PATH=/usr/java/bin:/home/itos/bin:/usr/kerberos/bin:/usr/local/bin:\
 /usr/bin:/bin:/usr/X11R6/bin:.

alias itos='fepitos -e'
```

#### B.1.2 Bash Profile file

‘/home/gfep/.bash\_profile’

```
.bash_profile

Get the aliases and functions
if [-f ~/.bashrc]; then
. ~/.bashrc
fi

if [-f ~/.Xdefaults]; then xrdp -merge ~/.Xdefaults; fi
```

```

User specific environment and startup programs

PATH=$PATH:$HOME/bin

export PATH
unset USERNAME

if [-z $SSH_TTY]; then
 (sleep 15; fepitos -e) &
fi

```

### B.1.3 Bash Logout file

```

'/home/gfep/.bash_logout'

~/.bash_logout

if [-z $SSH_TTY]; then cleanup + evtforward; fi

clear

```

### B.1.4 Network Initialization file

```

'/home/gfep/.netrc'

```

The `'/home/.netrc'` file is used to FASTCopy programs to lookup the login account and password information for a given MOC workstation when the PBE GFEPs FASTCopy postpass archives to the MOC. This is done so that the information won't be hardcoded in the STOL control procs.

```

machine gfep2 login glast password <hidden>
machine glastops1 login gfep2moc password <hidden>
machine glastops2 login gfep2moc password <hidden>

```

*NOTE: The passwords are <hidden> for security reasons.*

### B.1.5 Xdefaults Customization file

```

'/home/gfep/.Xdefaults'

!
! frmstats-page-specific resources
!
frmstats*foreground: white
frmstats*background: blue

```

```

frmstats*fontColor: black
frmstats.geometry: -0+0
frmstats.numRows: 5
frmstats.numCols: 43

!
! fep_frmstats-page-specific resources
!
fep_frmstats*foreground: white
fep_frmstats*background: blue
fep_frmstats*fontColor: black
fep_frmstats.geometry: -0+0
fep_frmstats.numRows: 9
fep_frmstats.numCols: 55

!
! STOL-Proc-specific resources
!
*Proc.geometry: 560x300+0+62
*Proc.iconic: False

!
! event-specific resources
!
stol_events.iconic: True
events.geometry: 1279x210+0+730

!
! gfepstats-page-specific resources
!
gfepstats.geometry: -0+130

```

## B.1.6 ITOS Runtime Configuration script

`‘/home/gfep/itosrc’`

The itosrc is the runtime configuration cshell script that is sourced by the ‘itos’ start script to initialize the local settings and global mnemonics used by the ITOS program set. Since there are 6 different GFEP workstations there are multiple ‘itosrc’ files and different versions based on whether the GFEP is an RTE or PBE. The files are named ‘itosrc.x.ionet’ or ‘itosrc.x.pipwan’ where the “x” is replaced by the GFEP number. The following are what each file looks like:

### B.1.6.1 GFEP 1 RTE itosrc

```
‘/home/gfep/itosrc.1.ionet’
```

```

#! /bin/csh -f
itosrc.1.ionet

setenv ITOS_PAGEPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_CFGMONPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_PROCPATH ~/procs:$ITOS_DIR/procs

setenv ITOS_IMGLOADDIR ~/loads
setenv ITOS_IMGDUMPDIR $ITOS_OUTPUTDIR/dumps
setenv ITOS_IMGREPORTDIR $ITOS_OUTPUTDIR/reports
setenv ITOS_FOPFIFODIR $ITOS_OUTPUTDIR/fifos
setenv ITOS_EVTFIFO $ITOS_OUTPUTDIR/fifos/event_fifo
setenv ITOS_STOLFIFO $ITOS_OUTPUTDIR/fifos/stol_fifo
setenv ITOS_PKDPDIR $ITOS_OUTPUTDIR/pktdumps
setenv ITOS_SNAPDIR $ITOS_OUTPUTDIR/snaps
setenv ITOS_SPRDIR $ITOS_OUTPUTDIR/prints
setenv ITOS_EVTLDIR $ITOS_OUTPUTDIR/logs
setenv ITOS_TM_ARCHDIR $ITOS_OUTPUTDIR/archive
setenv ITOS_HOTKEY_DIR $ITOS_OUTPUTDIR/hotkey

setenv ITOS_STATUSPG fep_frmstats
#setenv ITOS_BASEPG_2 gfepstats63

setenv ITOS_START_PROC gfep_start

setenv ITOS_SPACECRAFTID 77

setenv ITOS_TMCTRL_HOST ‘hostname’
setenv ITOS_TMCTRL_PORT 32000
setenv ITOS_DEF_EPOCH "01-001-00:00:00.100000"

setenv ITOS_FEP_ID 1 #WSGT_RTE
#setenv ITOS_FEP_ID 2 #STGT_RTE
#setenv ITOS_FEP_ID 3 #WSGT_PBE
#setenv ITOS_FEP_ID 4 #STGT_PBE
#setenv ITOS_FEP_ID 5 #SASS_RTE
#setenv ITOS_FEP_ID 6 #SASS_PBE
setenv ITOS_FEP_MODE 1 #prime
#setenv ITOS_FEP_MODE 2 #backup
setenv ITOS_FEP_STORERAW 1 #0 - don't log raw data, 1 - log raw data.
setenv ITOS_MOC_VCS "vc0 vc1"
setenv ITOS_MOC1HOST "glstops1"
setenv ITOS_MOC1PORT 62010
setenv ITOS_MOC1STATPORT 62011
setenv ITOS_MOC1STOLPORT 62012

```

```

setenv ITOS_MOC1EVTSPORT 62013
setenv ITOS_MOC2HOST "glastops2"
setenv ITOS_MOC2PORT 62010
setenv ITOS_MOC2STATPORT 62011
setenv ITOS_MOC2STOLPORT 62012
setenv ITOS_MOC2EVTSPORT 62013
setenv ITOS_MOC2TIMEO 30 #seconds - retry 2 once a minute
setenv ITOS_MOC2RETRY 1 #retry - once per host
setenv ITOS_MOC1TIMEO 30 #seconds - retry 2 once a minute
setenv ITOS_MOC1RETRY 1 #retry - once per host
setenv ITOS_MOC_CYCLES 52080 #cycle - for up to 7 days
setenv ITOS_MOC_STATINT 5 #interval between status packets to MOC
setenv ITOS_FCOPYHOST "glastops1"
setenv ITOS_FCOPYPORT 40000 #used for real moc
setenv ITOS_FCOPYUSER ""
setenv ITOS_FCOPYPWD ""
setenv ITOS_FCOPYDIR "" #if used must have the trailing /
setenv ITOS_FCOPYORDER_0_ "VC01"
setenv ITOS_FCOPYORDER_1_ "VC02"
setenv ITOS_FCOPYORDER_2_ "VC03"
setenv ITOS_FCOPYORDER_3_ "VC09"
setenv ITOS_FCOPYORDER_4_ "VC08"
setenv ITOS_FCOPYORDER_5_ "event"
setenv ITOS_FCOPYORDER_6_ "VC00"
setenv ITOS_FCOPYORDER_7_ ""
setenv ITOS_FCOPYRATE "250Kb"
#setenv ITOS_FCOPYRATE "5Mb"
setenv ITOS_STOLWKP $ITOS_MOC1STOLPORT
setenv GFEP_ARCH_DAYS 7 #number of days of archives to keep, 0 = infinite
setenv GFEP_MAXPASS 70
setenv GFEP_MOC_MAXQUE 2000
setenv GFEP_FCOPY_XTRA "-line_encrypt -line_cipher=des3 -line_phrase=gfep_fun"

```

### B.1.6.2 GFEP 2 PBE itosrc

‘/home/gfep/itosrc.2.pipwan’

```

#!/bin/csh -f
itosrc.2.pipwan

setenv ITOS_PAGEPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_CFGMONPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_PROCPATH ~/procs:$ITOS_DIR/procs

setenv ITOS_IMGLOADDIR ~/loads
setenv ITOS_IMGDUMPDIR $ITOS_OUTPUTDIR/dumps

```

```

setenv ITOS_IMGREPORTDIR $ITOS_OUTPUTDIR/reports
setenv ITOS_FOPFIFODIR $ITOS_OUTPUTDIR/fifos
setenv ITOS_EVTFIFO $ITOS_OUTPUTDIR/fifos/event_fifo
setenv ITOS_STOLFIFO $ITOS_OUTPUTDIR/fifos/stol_fifo
setenv ITOS_PKDPDIR $ITOS_OUTPUTDIR/pktdumps
setenv ITOS_SNAPDIR $ITOS_OUTPUTDIR/snaps
setenv ITOS_SPRTDIR $ITOS_OUTPUTDIR/prints
setenv ITOS_EVTLDIR $ITOS_OUTPUTDIR/logs
setenv ITOS_TM_ARCHDIR $ITOS_OUTPUTDIR/archive
setenv ITOS_HOTKEY_DIR $ITOS_OUTPUTDIR/hotkey

setenv ITOS_STATUSPG fep_frmstats
#setenv ITOS_BASEPG_2 gfepstats63

setenv ITOS_START_PROC gfep_start

setenv ITOS_SPACECRAFTID 77

setenv ITOS_TMCTRL_HOST 'hostname'
setenv ITOS_TMCTRL_PORT 32000
setenv ITOS_DEF_EPOCH "01-001-00:00:00.100000"

#setenv ITOS_FEP_ID 1 #WSGT_RTE
#setenv ITOS_FEP_ID 2 #STGT_RTE
setenv ITOS_FEP_ID 3 #WSGT_PBE
#setenv ITOS_FEP_ID 4 #STGT_PBE
#setenv ITOS_FEP_ID 5 #SASS_RTE
#setenv ITOS_FEP_ID 6 #SASS_PBE
#setenv ITOS_FEP_MODE 1 #prime
setenv ITOS_FEP_MODE 2 #backup
setenv ITOS_FEP_STORERAW 1 #0 - don't log raw data, 1 - log raw data.
setenv ITOS_MOC_VCS "vc0 vc1"
setenv ITOS_MOC1HOST "glastops1"
setenv ITOS_MOC1PORT 62020
setenv ITOS_MOC1STATPORT 62021
setenv ITOS_MOC1STOLPORT 62022
setenv ITOS_MOC1EVTPORT 62023
setenv ITOS_MOC2HOST "glastops2"
setenv ITOS_MOC2PORT 62020
setenv ITOS_MOC2STATPORT 62021
setenv ITOS_MOC2STOLPORT 62022
setenv ITOS_MOC2EVTPORT 62023
setenv ITOS_MOC2TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC2RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC1TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC1RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC_CYCLES 52080 #cycle - for up to 7 days

```

```

setenv ITOS_MOC_STATINT 5 #interval between status packets to MOC
setenv ITOS_FCOPYHOST "glstops1"
setenv ITOS_FCOPYPORT 40000 #used for real moc
setenv ITOS_FCOPYUSER ""
setenv ITOS_FCOPYPWD ""
setenv ITOS_FCOPYDIR "" #if used must have the trailing /
setenv ITOS_FCOPYORDER_0_ "VC01"
setenv ITOS_FCOPYORDER_1_ "VC02"
setenv ITOS_FCOPYORDER_2_ "VC03"
setenv ITOS_FCOPYORDER_3_ "VC09"
setenv ITOS_FCOPYORDER_4_ "VC08"
setenv ITOS_FCOPYORDER_5_ "event"
setenv ITOS_FCOPYORDER_6_ "VC00"
setenv ITOS_FCOPYORDER_7_ ""
#setenv ITOS_FCOPYRATE "250Kb"
setenv ITOS_FCOPYRATE "100%"
setenv ITOS_STOLWKP $ITOS_MOC1STOLPORT
setenv GFEP_ARCH_DAYS 7 #number of days of archives to keep, 0 = infinite
setenv GFEP_MAXPASS 70
setenv GFEP_MOC_MAXQUE 2000
setenv GFEP_FCOPY_XTRA "-line_encrypt -line_cipher=des3 -line_phrase=gfep_fun"

```

### B.1.6.3 GFEP 3 RTE itosrc

‘/home/gfep/itosrc.3.ionet’

```

#! /bin/csh -f
itosrc.3.ionet

setenv ITOS_PAGEPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_CFGMONPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_PROCPATH ~/procs:$ITOS_DIR/procs

setenv ITOS_IMGLOADDIR ~/loads
setenv ITOS_IMGDUMPDIR $ITOS_OUTPUTDIR/dumps
setenv ITOS_IMGREPORTDIR $ITOS_OUTPUTDIR/reports
setenv ITOS_FOPFIFODIR $ITOS_OUTPUTDIR/fifos
setenv ITOS_EVTFIFO $ITOS_OUTPUTDIR/fifos/event_fifo
setenv ITOS_STOLFIFO $ITOS_OUTPUTDIR/fifos/stol_fifo
setenv ITOS_PKDPDIR $ITOS_OUTPUTDIR/pktdumps
setenv ITOS_SNAPDIR $ITOS_OUTPUTDIR/snaps
setenv ITOS_SPRDIR $ITOS_OUTPUTDIR/prints
setenv ITOS_EVTLDIR $ITOS_OUTPUTDIR/logs
setenv ITOS_TM_ARCHDIR $ITOS_OUTPUTDIR/archive
setenv ITOS_HOTKEY_DIR $ITOS_OUTPUTDIR/hotkey

```

```

setenv ITOS_STATUSPG fep_frmstats
#setenv ITOS_BASEPG_2 gfepstats63

setenv ITOS_START_PROC gfep_start

setenv ITOS_SPACECRAFTID 77

setenv ITOS_TMCTRL_HOST 'hostname'
setenv ITOS_TMCTRL_PORT 32000
setenv ITOS_DEF_EPOCH "01-001-00:00:00.100000"

setenv ITOS_FEP_ID 1 #WSGT_RTE
#setenv ITOS_FEP_ID 2 #STGT_RTE
#setenv ITOS_FEP_ID 3 #WSGT_PBE
#setenv ITOS_FEP_ID 4 #STGT_PBE
#setenv ITOS_FEP_ID 5 #SASS_RTE
#setenv ITOS_FEP_ID 6 #SASS_PBE
#setenv ITOS_FEP_MODE 1 #prime
setenv ITOS_FEP_MODE 2 #backup
setenv ITOS_FEP_STORERAW 1 #0 - don't log raw data, 1 - log raw data.
setenv ITOS_MOC_VCS "vc0 vc1"
setenv ITOS_MOC1HOST "glastops1"
setenv ITOS_MOC1PORT 62030
setenv ITOS_MOC1STATPORT 62031
setenv ITOS_MOC1STOLPORT 62032
setenv ITOS_MOC1EVTPORT 62033
setenv ITOS_MOC2HOST "glastops2"
setenv ITOS_MOC2PORT 62030
setenv ITOS_MOC2STATPORT 62031
setenv ITOS_MOC2STOLPORT 62032
setenv ITOS_MOC2EVTPORT 62033
setenv ITOS_MOC2TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC2RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC1TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC1RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC_CYCLES 1440 #cycle 24 - for up to 24 hours
setenv ITOS_MOC_STATINT 5 #interval between status packets to MOC
setenv ITOS_FCOPYHOST "glastops1"
setenv ITOS_FCOPYPORT 40000 #used for real moc
setenv ITOS_FCOPYUSER ""
setenv ITOS_FCOPYPWD ""
setenv ITOS_FCOPYDIR "" #if used must have the trailing /
setenv ITOS_FCOPYORDER_0_ "VC01"
setenv ITOS_FCOPYORDER_1_ "VC02"
setenv ITOS_FCOPYORDER_2_ "VC03"
setenv ITOS_FCOPYORDER_3_ "VC09"
setenv ITOS_FCOPYORDER_4_ "VC08"

```

```

setenv ITOS_FCOPYORDER_5_ "event"
setenv ITOS_FCOPYORDER_6_ "VC00"
setenv ITOS_FCOPYORDER_7_ ""
setenv ITOS_FCOPYRATE "250Kb"
#setenv ITOS_FCOPYRATE "100%"
setenv ITOS_STOLWKP $ITOS_MOC1STOLPORT
setenv GFEP_ARCH_DAYS 7 #number of days of archives to keep, 0 = infinite
setenv GFEP_MAXPASS 70
setenv GFEP_MOC_MAXQUE 2000
setenv GFEP_FCOPY_XTRA "-line_encrypt -line_cipher=des3 -line_phrase=gfep_fun"

```

#### B.1.6.4 GFEP 3 PBE itosrc

‘/home/gfep/itosrc.3.pipwan’

```

#! /bin/csh -f
itosrc.3.pipwan

setenv ITOS_PAGEPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_CFGMONPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_PROCPATH ~/procs:$ITOS_DIR/procs

setenv ITOS_IMGLOADDIR ~/loads
setenv ITOS_IMGDUMPDIR $ITOS_OUTPUTDIR/dumps
setenv ITOS_IMGREPORTDIR $ITOS_OUTPUTDIR/reports
setenv ITOS_FOPFIFODIR $ITOS_OUTPUTDIR/fifos
setenv ITOS_EVTFIFO $ITOS_OUTPUTDIR/fifos/event_fifo
setenv ITOS_STOLFIFO $ITOS_OUTPUTDIR/fifos/stol_fifo
setenv ITOS_PKDPDIR $ITOS_OUTPUTDIR/pktdumps
setenv ITOS_SNAPDIR $ITOS_OUTPUTDIR/snaps
setenv ITOS_SPRTDIR $ITOS_OUTPUTDIR/prints
setenv ITOS_EVTLDIR $ITOS_OUTPUTDIR/logs
setenv ITOS_TM_ARCHDIR $ITOS_OUTPUTDIR/archive
setenv ITOS_HOTKEY_DIR $ITOS_OUTPUTDIR/hotkey

setenv ITOS_STATUSPG fep_frmstats
#setenv ITOS_BASEPG_2 gfepstats63

setenv ITOS_START_PROC gfep_start

setenv ITOS_SPACECRAFTID 77

setenv ITOS_TMCTRL_HOST 'hostname'
setenv ITOS_TMCTRL_PORT 32000
setenv ITOS_DEF_EPOCH "01-001-00:00:00.100000"

```

```

#setenv ITOS_FEP_ID 1 #WSGT_RTE
#setenv ITOS_FEP_ID 2 #STGT_RTE
setenv ITOS_FEP_ID 3 #WSGT_PBE
#setenv ITOS_FEP_ID 4 #STGT_PBE
#setenv ITOS_FEP_ID 5 #SASS_RTE
#setenv ITOS_FEP_ID 6 #SASS_PBE
#setenv ITOS_FEP_MODE 1 #prime
setenv ITOS_FEP_MODE 2 #backup
setenv ITOS_FEP_STORERAW 1 #0 - don't log raw data, 1 - log raw data.
setenv ITOS_MOC_VCS "vc0 vc1"
setenv ITOS_MOC1HOST "glastops1"
setenv ITOS_MOC1PORT 62030
setenv ITOS_MOC1STATPORT 62031
setenv ITOS_MOC1STOLPORT 62032
setenv ITOS_MOC1EVTPORT 62033
setenv ITOS_MOC2HOST "glastops2"
setenv ITOS_MOC2PORT 62030
setenv ITOS_MOC2STATPORT 62031
setenv ITOS_MOC2STOLPORT 62032
setenv ITOS_MOC2EVTPORT 62033
setenv ITOS_MOC2TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC2RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC1TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC1RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC_CYCLES 1440 #cycle 24 - for up to 24 hours
setenv ITOS_MOC_STATINT 5 #interval between status packets to MOC
setenv ITOS_FCOPYHOST "glastops1"
setenv ITOS_FCOPYPORT 40000 #used for real moc
setenv ITOS_FCOPYUSER ""
setenv ITOS_FCOPYPWD ""
setenv ITOS_FCOPYDIR "" #if used must have the trailing /
setenv ITOS_FCOPYORDER_0_ "VC01"
setenv ITOS_FCOPYORDER_1_ "VC02"
setenv ITOS_FCOPYORDER_2_ "VC03"
setenv ITOS_FCOPYORDER_3_ "VC09"
setenv ITOS_FCOPYORDER_4_ "VC08"
setenv ITOS_FCOPYORDER_5_ "event"
setenv ITOS_FCOPYORDER_6_ "VC00"
setenv ITOS_FCOPYORDER_7_ ""
#setenv ITOS_FCOPYRATE "250Kb"
setenv ITOS_FCOPYRATE "100%"
setenv ITOS_STOLWKP $ITOS_MOC1STOLPORT
setenv GFEP_ARCH_DAYS 7 #number of days of archives to keep, 0 = infinite
setenv GFEP_MAXPASS 70
setenv GFEP_MOC_MAXQUE 2000
setenv GFEP_FCOPY_XTRA "--line_encrypt -line_cipher=des3 -line_phrase=gfep_fun"

```

### B.1.6.5 GFEP 4 RTE itosrc

```
'/home/gfep/itosrc.4.ionet'
```

```
#! /bin/csh -f
itosrc.4.ionet

setenv ITOS_PAGEPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_CFGMONPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_PROCPATH ~/procs:$ITOS_DIR/procs

setenv ITOS_IMGLOADDIR ~/loads
setenv ITOS_IMGDUMPDIR $ITOS_OUTPUTDIR/dumps
setenv ITOS_IMGREPORTDIR $ITOS_OUTPUTDIR/reports
setenv ITOS_FOPFIFODIR $ITOS_OUTPUTDIR/fifos
setenv ITOS_EVTFIFO $ITOS_OUTPUTDIR/fifos/event_fifo
setenv ITOS_STOLFIFO $ITOS_OUTPUTDIR/fifos/stol_fifo
setenv ITOS_PKDPDIR $ITOS_OUTPUTDIR/pktdumps
setenv ITOS_SNAPDIR $ITOS_OUTPUTDIR/snaps
setenv ITOS_SPRTDIR $ITOS_OUTPUTDIR/prints
setenv ITOS_EVTLDIR $ITOS_OUTPUTDIR/logs
setenv ITOS_TM_ARCHDIR $ITOS_OUTPUTDIR/archive
setenv ITOS_HOTKEY_DIR $ITOS_OUTPUTDIR/hotkey

setenv ITOS_STATUSPG fep_frmstats
#setenv ITOS_BASEPG_2 gfepstats63

setenv ITOS_START_PROC gfep_start

setenv ITOS_SPACECRAFTID 77

setenv ITOS_TMCTRL_HOST 'hostname'
setenv ITOS_TMCTRL_PORT 32000
setenv ITOS_DEF_EPOCH "01-001-00:00:00.100000"

#setenv ITOS_FEP_ID 1 #WSGT_RTE
setenv ITOS_FEP_ID 2 #STGT_RTE
#setenv ITOS_FEP_ID 3 #WSGT_PBE
#setenv ITOS_FEP_ID 4 #STGT_PBE
#setenv ITOS_FEP_ID 5 #SASS_RTE
#setenv ITOS_FEP_ID 6 #SASS_PBE
setenv ITOS_FEP_MODE 1 #prime
#setenv ITOS_FEP_MODE 2 #backup
setenv ITOS_FEP_STORERAW 1 #0 - don't log raw data, 1 - log raw data.
setenv ITOS_MOC_VCS "vc0 vc1"
setenv ITOS_MOC1HOST "glastops1"
```

```

setenv ITOS_MOC1PORT 62040
setenv ITOS_MOC1STATPORT 62041
setenv ITOS_MOC1STOLPORT 62042
setenv ITOS_MOC1EVTPORT 62043
setenv ITOS_MOC2HOST "glastops2"
setenv ITOS_MOC2PORT 62040
setenv ITOS_MOC2STATPORT 62041
setenv ITOS_MOC2STOLPORT 62042
setenv ITOS_MOC2EVTPORT 62043
setenv ITOS_MOC2TIMEO 30 #seconds - retry once a minute
setenv ITOS_MOC2RETRY 1 #retry - for 60 minutes
setenv ITOS_MOC1TIMEO 30 #seconds - retry once a minute
setenv ITOS_MOC1RETRY 1 #retry - for 60 minutes
setenv ITOS_MOC_CYCLES 52080 #cycle - for up to 7 days
setenv ITOS_MOC_STATINT 5 #interval between status packets to MOC
setenv ITOS_FCOPYHOST "glastops1"
setenv ITOS_FCOPYPORT 40000 #used for real moc
setenv ITOS_FCOPYUSER ""
setenv ITOS_FCOPYPWD ""
setenv ITOS_FCOPYDIR "" #if used must have the trailing /
setenv ITOS_FCOPYORDER_0_ "VC01"
setenv ITOS_FCOPYORDER_1_ "VC02"
setenv ITOS_FCOPYORDER_2_ "VC03"
setenv ITOS_FCOPYORDER_3_ "VC09"
setenv ITOS_FCOPYORDER_4_ "VC08"
setenv ITOS_FCOPYORDER_5_ "event"
setenv ITOS_FCOPYORDER_6_ "VC00"
setenv ITOS_FCOPYORDER_7_ ""
setenv ITOS_FCOPYRATE "250Kb"
#setenv ITOS_FCOPYRATE "5Mb"
setenv ITOS_STOLWKP $ITOS_MOC1STOLPORT
setenv GFEP_ARCH_DAYS 7 #number of days of archives to keep, 0 = infinite
setenv GFEP_MAXPASS 70
setenv GFEP_MOC_MAXQUE 2000
setenv GFEP_FCOPY_XTRA "-line_encrypt -line_cipher=des3 -line_phrase=gfep_fun"

```

### B.1.6.6 GFEP 5 PBE itosrc

‘/home/gfep/itosrc.5.pipwan’

```

#!/bin/csh -f
itosrc.5.pipwan

setenv ITOS_PAGEPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_CFGMONPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_PROCPATH ~/procs:$ITOS_DIR/procs

```

```

setenv ITOS_IMGLOADDIR ~/loads
setenv ITOS_IMGDUMPDIR $ITOS_OUTPUTDIR/dumps
setenv ITOS_IMGREPORTDIR $ITOS_OUTPUTDIR/reports
setenv ITOS_FOPFIFODIR $ITOS_OUTPUTDIR/fifos
setenv ITOS_EVTFIFO $ITOS_OUTPUTDIR/fifos/event_fifo
setenv ITOS_STOLFIFO $ITOS_OUTPUTDIR/fifos/stol_fifo
setenv ITOS_PKDPDIR $ITOS_OUTPUTDIR/pktdumps
setenv ITOS_SNAPDIR $ITOS_OUTPUTDIR/snaps
setenv ITOS_SPRTDIR $ITOS_OUTPUTDIR/prints
setenv ITOS_EVTLDIR $ITOS_OUTPUTDIR/logs
setenv ITOS_TM_ARCHDIR $ITOS_OUTPUTDIR/archive
setenv ITOS_HOTKEY_DIR $ITOS_OUTPUTDIR/hotkey

setenv ITOS_STATUSPG fep_frmstats
#setenv ITOS_BASEPG_2 gfepstats63

setenv ITOS_START_PROC gfep_start

setenv ITOS_SPACECRAFTID 77

setenv ITOS_TMCTRL_HOST 'hostname'
setenv ITOS_TMCTRL_PORT 32000
setenv ITOS_DEF_EPOCH "01-001-00:00:00.100000"

#setenv ITOS_FEP_ID 1 #WSGT_RTE
#setenv ITOS_FEP_ID 2 #STGT_RTE
#setenv ITOS_FEP_ID 3 #WSGT_PBE
setenv ITOS_FEP_ID 4 #STGT_PBE
#setenv ITOS_FEP_ID 5 #SASS_RTE
#setenv ITOS_FEP_ID 6 #SASS_PBE
#setenv ITOS_FEP_MODE 1 #prime
setenv ITOS_FEP_MODE 2 #backup
setenv ITOS_FEP_STORERAW 1 #0 - don't log raw data, 1 - log raw data.
setenv ITOS_MOC_VCS "vc0 vc1"
setenv ITOS_MOC1HOST "glastops1"
setenv ITOS_MOC1PORT 62050
setenv ITOS_MOC1STATPORT 62051
setenv ITOS_MOC1STOLPORT 62052
setenv ITOS_MOC1EVTPORT 62053
setenv ITOS_MOC2HOST "glastops2"
setenv ITOS_MOC2PORT 62050
setenv ITOS_MOC2STATPORT 62051
setenv ITOS_MOC2STOLPORT 62052
setenv ITOS_MOC2EVTPORT 62053
setenv ITOS_MOC2TIMED 30 #seconds - retry twice a minute
setenv ITOS_MOC2RETRY 1 #retry - for 1 minutes

```

```

setenv ITOS_MOC1TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC1RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC_CYCLES 52080 #cycle - for up to 7 days
setenv ITOS_MOC_STATINT 5 #interval between status packets to MOC
setenv ITOS_FCOPYHOST "glstops1"
setenv ITOS_FCOPYPORT 40000 #used for real moc
setenv ITOS_FCOPYUSER ""
setenv ITOS_FCOPYPWD ""
setenv ITOS_FCOPYDIR "" #if used must have the trailing /
setenv ITOS_FCOPYORDER_0_ "VC01"
setenv ITOS_FCOPYORDER_1_ "VC02"
setenv ITOS_FCOPYORDER_2_ "VC03"
setenv ITOS_FCOPYORDER_3_ "VC09"
setenv ITOS_FCOPYORDER_4_ "VC08"
setenv ITOS_FCOPYORDER_5_ "event"
setenv ITOS_FCOPYORDER_6_ "VC00"
setenv ITOS_FCOPYORDER_7_ ""
#setenv ITOS_FCOPYRATE "250Kb"
setenv ITOS_FCOPYRATE "100%"
setenv ITOS_STOLWKP $ITOS_MOC1STOLPORT
setenv GFEP_ARCH_DAYS 7 #number of days of archives to keep, 0 = infinite
setenv GFEP_MAXPASS 70
setenv GFEP_MOC_MAXQUE 2000
setenv GFEP_FCOPY_XTRA "-line_encrypt -line_cipher=des3 -line_phrase=gfep_fun"

```

### B.1.6.7 GFEP 6 RTE itosrc

‘/home/gfep/itosrc.6.ionet’

```

#! /bin/csh -f
itosrc.6.ionet

setenv ITOS_PAGEPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_CFGMONPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_PROCPATH ~/procs:$ITOS_DIR/procs

setenv ITOS_IMGLOADDIR ~/loads
setenv ITOS_IMGDUMPDIR $ITOS_OUTPUTDIR/dumps
setenv ITOS_IMGREPORTDIR $ITOS_OUTPUTDIR/reports
setenv ITOS_FOPFIFODIR $ITOS_OUTPUTDIR/fifos
setenv ITOS_EVTFIFO $ITOS_OUTPUTDIR/fifos/event_fifo
setenv ITOS_STOLFIFO $ITOS_OUTPUTDIR/fifos/stol_fifo
setenv ITOS_PKDPDIR $ITOS_OUTPUTDIR/pktdumps
setenv ITOS_SNAPDIR $ITOS_OUTPUTDIR/snaps
setenv ITOS_SPRTDIR $ITOS_OUTPUTDIR/prints
setenv ITOS_EVTLDIR $ITOS_OUTPUTDIR/logs

```

```

setenv ITOS_TM_ARCHDIR $ITOS_OUTPUTDIR/archive
setenv ITOS_HOTKEY_DIR $ITOS_OUTPUTDIR/hotkey

setenv ITOS_STATUSPG fep_frmstats
#setenv ITOS_BASEPG_2 gfepstats63

setenv ITOS_START_PROC gfep_start

setenv ITOS_SPACECRAFTID 77

setenv ITOS_TMCTRL_HOST 'hostname'
setenv ITOS_TMCTRL_PORT 32000
setenv ITOS_DEF_EPOCH "01-001-00:00:00.100000"

#setenv ITOS_FEP_ID 1 #WSGT_RTE
setenv ITOS_FEP_ID 2 #STGT_RTE
#setenv ITOS_FEP_ID 3 #WSGT_PBE
#setenv ITOS_FEP_ID 4 #STGT_PBE
#setenv ITOS_FEP_ID 5 #SASS_RTE
#setenv ITOS_FEP_ID 6 #SASS_PBE
#setenv ITOS_FEP_MODE 1 #prime
setenv ITOS_FEP_MODE 2 #backup
setenv ITOS_FEP_STORERAW 1 #0 - don't log raw data, 1 - log raw data.
setenv ITOS_MOC_VCS "vc0 vc1"
setenv ITOS_MOC1HOST "glastops1"
setenv ITOS_MOC1PORT 62060
setenv ITOS_MOC1STATPORT 62061
setenv ITOS_MOC1STOLPORT 62062
setenv ITOS_MOC1EVTPORT 62063
setenv ITOS_MOC2HOST "glastops2"
setenv ITOS_MOC2PORT 62060
setenv ITOS_MOC2STATPORT 62061
setenv ITOS_MOC2STOLPORT 62062
setenv ITOS_MOC2EVTPORT 62063
setenv ITOS_MOC2TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC2RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC1TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC1RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC_CYCLES 1440 #cycle 24 - for up to 24 hours
setenv ITOS_MOC_STATINT 5 #interval between status packets to MOC
setenv ITOS_FCOPYHOST "glastops1"
setenv ITOS_FCOPYPORT 40000 #used for real moc
setenv ITOS_FCOPYUSER ""
setenv ITOS_FCOPYPWD ""
setenv ITOS_FCOPYDIR "" #if used must have the trailing /
setenv ITOS_FCOPYORDER_0_ "VC01"
setenv ITOS_FCOPYORDER_1_ "VC02"

```

```

setenv ITOS_FCOPYORDER_2_ "VC03"
setenv ITOS_FCOPYORDER_3_ "VC09"
setenv ITOS_FCOPYORDER_4_ "VC08"
setenv ITOS_FCOPYORDER_5_ "event"
setenv ITOS_FCOPYORDER_6_ "VC00"
setenv ITOS_FCOPYORDER_7_ ""
setenv ITOS_FCOPYRATE "250Kb"
#setenv ITOS_FCOPYRATE "5Mb"
setenv ITOS_STOLWKP $ITOS_MOC1STOLPORT
setenv GFEP_ARCH_DAYS 7 #number of days of archives to keep, 0 = infinite
setenv GFEP_MAXPASS 70
setenv GFEP_MOC_MAXQUE 2000
setenv GFEP_FCOPY_XTRA "-line_encrypt -line_cipher=des3 -line_phrase=gfep_fun"

```

### B.1.6.8 GFEP 6 PBE itosrc

‘/home/gfep/itosrc.6.pipwan’

```

#! /bin/csh -f
itosrc.6.pipwan

setenv ITOS_PAGEPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_CFGMONPATH ~/pages:$ITOS_DIR/pages
setenv ITOS_PROCPATH ~/procs:$ITOS_DIR/procs

setenv ITOS_IMGLOADDIR ~/loads
setenv ITOS_IMGDUMPDIR $ITOS_OUTPUTDIR/dumps
setenv ITOS_IMGREPORTDIR $ITOS_OUTPUTDIR/reports
setenv ITOS_FOPFIFODIR $ITOS_OUTPUTDIR/fifos
setenv ITOS_EVTFIFO $ITOS_OUTPUTDIR/fifos/event_fifo
setenv ITOS_STOLFIFO $ITOS_OUTPUTDIR/fifos/stol_fifo
setenv ITOS_PKDPDIR $ITOS_OUTPUTDIR/pktdumps
setenv ITOS_SNAPDIR $ITOS_OUTPUTDIR/snaps
setenv ITOS_SPRTDIR $ITOS_OUTPUTDIR/prints
setenv ITOS_EVTLDIR $ITOS_OUTPUTDIR/logs
setenv ITOS_TM_ARCHDIR $ITOS_OUTPUTDIR/archive
setenv ITOS_HOTKEY_DIR $ITOS_OUTPUTDIR/hotkey

setenv ITOS_STATUSPG fep_frmstats
#setenv ITOS_BASEPG_2 gfepstats63

setenv ITOS_START_PROC gfep_start

setenv ITOS_SPACECRAFTID 77

setenv ITOS_TMCTRL_HOST 'hostname'

```

```

setenv ITOS_TMCTRL_PORT 32000
setenv ITOS_DEF_EPOCH "01-001-00:00:00.100000"

#setenv ITOS_FEP_ID 1 #WSGT_RTE
#setenv ITOS_FEP_ID 2 #STGT_RTE
#setenv ITOS_FEP_ID 3 #WSGT_PBE
setenv ITOS_FEP_ID 4 #STGT_PBE
#setenv ITOS_FEP_ID 5 #SASS_RTE
#setenv ITOS_FEP_ID 6 #SASS_PBE
#setenv ITOS_FEP_MODE 1 #prime
setenv ITOS_FEP_MODE 2 #backup
setenv ITOS_FEP_STORERAW 1 #0 - don't log raw data, 1 - log raw data.
setenv ITOS_MOC_VCS "vc0 vc1"
setenv ITOS_MOC1HOST "glastops1"
setenv ITOS_MOC1PORT 62060
setenv ITOS_MOC1STATPORT 62061
setenv ITOS_MOC1STOLPORT 62062
setenv ITOS_MOC1EVTPORT 62063
setenv ITOS_MOC2HOST "glastops2"
setenv ITOS_MOC2PORT 62060
setenv ITOS_MOC2STATPORT 62061
setenv ITOS_MOC2STOLPORT 62062
setenv ITOS_MOC2EVTPORT 62063
setenv ITOS_MOC2TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC2RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC1TIMEO 30 #seconds - retry twice a minute
setenv ITOS_MOC1RETRY 1 #retry - for 1 minutes
setenv ITOS_MOC_CYCLES 1440 #cycle 24 - for up to 24 hours
setenv ITOS_MOC_STATINT 5 #interval between status packets to MOC
setenv ITOS_FCOPYHOST "glastops1"
setenv ITOS_FCOPYPORT 40000 #used for real moc
setenv ITOS_FCOPYUSER ""
setenv ITOS_FCOPYPWD ""
setenv ITOS_FCOPYDIR "" #if used must have the trailing /
setenv ITOS_FCOPYORDER_0_ "VC01"
setenv ITOS_FCOPYORDER_1_ "VC02"
setenv ITOS_FCOPYORDER_2_ "VC03"
setenv ITOS_FCOPYORDER_3_ "VC09"
setenv ITOS_FCOPYORDER_4_ "VC08"
setenv ITOS_FCOPYORDER_5_ "event"
setenv ITOS_FCOPYORDER_6_ "VC00"
setenv ITOS_FCOPYORDER_7_ ""
#setenv ITOS_FCOPYRATE "250Kb"
setenv ITOS_FCOPYRATE "100%"
setenv ITOS_STOLWKP $ITOS_MOC1STOLPORT
setenv GFEP_ARCH_DAYS 7 #number of days of archives to keep, 0 = infinite
setenv GFEP_MAXPASS 70

```

```
setenv GFEP_MOC_MAXQUE 2000
setenv GFEP_FCOPY_XTRA "-line_encrypt -line_cipher=des3 -line_phrase=gfep_fun"
```

### B.1.7 ITOS database build script

‘/home/gfep/makedb’

The ‘makedb’ shell script is used to generate the GFEP ITOS runtime operational database located in ‘/home/gfep/odb’ directory. It is invoked by typing ./makedb during the Section 2.17 [GFEP Home Directory Install], page 13 and can be rerun when necessary if the MOC changes any of the input files in (undefined) [/home/gfep/dbx directory], page (undefined) or updates the ITOS version that updates any of its database source files in ‘/home/itos/dbx’.

```
#!/bin/sh
if [-z $1]; then version="1.0"; else version=$1; fi
itos_dir='itosrun env | grep ITOS_DIR | cut -d= -f 2'
itosrun dbxodb -version $version -epochdef gbl_def_epoch \
 -odbdir ~/odb $itos_dir/dbx/*.dbx* ~/dbx/*.dbx 2>&1 \
 |tee makedb.log$version
```

### B.1.8 syncit program

‘/home/gfep/syncit’

‘syncit’ program - modified version of the ITOS ‘sync’ program that only outputs when sync is lost.

### B.1.9 check script

‘/home/gfep/check’

script ‘check’ - runs ‘checkit’ on all the VC files in the ‘/home/gfep/output/archive’ directory.

```
cd /home/gfep/output/archive
find -name "GF*_200*_VC*.[01234]" -printf "%p " -exec /home/gfep/checkit ";"
```

### B.1.10 checkit script

`‘/home/gfep/checkit’`

```
script ‘checkit’ - repacks frames with leo-t header removed
 repack 1279 10 <$1 |cksum
```

### B.1.11 syncall script

`‘/home/gfep/syncall’`

script ‘syncall’ - run the syncit program on all the VC files in the ‘/home/gfep/output/archive’ directory.

```
cd /home/gfep/output/archive
for vdir in ‘echo 200*‘; do
 for vc in VC00 VC01 VC02 VC03 VC08 VC09; do
 fall=‘echo $vdir/*$vc.[01234]‘
 for f in $fall; do
 echo $f
 /home/gfep/syncit <$f
 done
 done
done
done
```

### B.1.12 syncstrip script

`‘/home/gfep/syncstrip’`

```
script ‘syncstrip’ -
 grep -v "error\!" sync.lst |grep -v SCID
```

### B.1.13 verify script

`‘/home/gfep/verify’`

script ‘verify’ - greps all the event logs in ‘/home/gfep/output/archive’ for VC totals from passes.

```
(cd ~/output/archive/; grep frames 200/*event*|grep STOL_MSG|\
grep -v Assigning)
```

## B.2 gfep/dbx directory

## sc\_command.dbx

The 'sc\_command.dbx' file has been copied from the Swift project in lieu of one for Glast which had not been created at the time the GFEP was being developed. The packet format was modified to be in line with the MOC plans to use a TIME44 type for the spacecraft time with the epoch date of Jan 1 00:00:00 2001. This packet defines AppID 2045 which is used by the frame\_sorter program to decommutate the spacecraft downlink time from the secondary header. This time is used in the archive header used by playback at the MOC. If this isn't present then the spacecraft time would be missing and only ground receive time would be valid.

```
#####
Define Swift Transfer Frame Telemetry Points
#
The insert zone / secondary header is forwarded in AppID 2045 for
each frame that is processed on a VC for which we're extracting packets.
AppID 2045 consists of a packet primary header, followed by the 4-byte
secondary header or the insert zone.
#
VERSION:
Spectrum Astro, Inc.
CVS $Header: /home/swift/CVSswift/dbx/sc/sc_command.dbx,v 1.3
2003/03/18 15:41:18 swift Exp $
CVS TAG $Name: Release_7-5 $
#
CHANGE HISTORY:
Date Author Description

06/15/01 Jonathan Yount Origin.
#####

Define delimiter
DEL,|

Define mnemonic to decommutating the AOS Transfer Frame insert zone
TLM|SGBL_TF_XMITTIME|+||ITOS_TM|TIME44|64|||1|||T|
"AOS Transfer Frame Transmit Time"
TLM|SGBL_TF_XMITSEC|+||ITOS_TM|U1234|32|||1|||T|
"AOS Transfer Frame Transmit Seconds"
TLM|SGBL_TF_XMITSUB|+||ITOS_TM|U1234|20|||1|||0|T|
"AOS Transfer Frame Transmit Subseconds"
TLM|SGBL_2045_EPOCH|+||ITOS_TM|TIME44|64|||1|||"01-001-00:00:00.1000000"|T|

PKT|2045|SGBL_TF_XMITTIME|+||TIME44|6||SGBL_2045_EPOCH
PKT|2045|SGBL_TF_XMITSEC|+|||6
PKT|2045|SGBL_TF_XMITSUB|+|||10|12

MAP|2045|+||ITOS_TM|SGBL_TF_XMITTIME|"AOS Transfer Frame Insert Zone"
```

### B.3 gfep/odb directory

The 'odb' subdirectory contain the ITOS operational database populated by the Section B.1.7 [makedb], page 56 shell script run during the system installation.

### B.4 gfep/output directory

The following subdirectories are created empty and thus no files are listed. They are populated by the GFEP initialization and during the operation of the ITOS software.

- archive
- dumps
- fifos
- hotkey
- logs
- pktdumps
- prints
- reports
- snaps

### B.5 gfep/pages directory

#### 'gfep/pages/gfepstats63.page'

The 'gfepstats63.page' file is a page file designed for system verification/testing and is not required for system operation which is why it is not included with the ITOS supplied pages.

```
page gfepstats63
```

```
#(C)***** 3.8 **
#(C) Copyright 1999-2006, United States Government as represented by the *
#(C) Administrator of the National Aeronautics and Space Administration. *
#(C) No copyright is claimed in the United States under Title 17, *
#(C) U.S. Code. *
#(C) *
#(C) This software and documentation are a controlled export and may only *
#(C) be released to U.S. Citizens and appropriate Permanent Residents in *
#(C) the United States. If you have any questions with respect to this *
#(C) constraint contact the GSFC center export administrator, *
#(C) <Thomas.R.Weisz@nasa.gov>. *
#(C) *
#(C) This product contains software from the Integrated Test and Operations *
#(C) System (ITOS), a satellite ground data system developed at the Goddard *
#(C) Space Flight Center in Greenbelt MD. See <http://itos.gsfc.nasa.gov/> *
```

```

#(C) or e-mail <itos@itos.gsfc.nasa.gov> for additional information. *
#(C) *
#(C) You may use this software for any purpose provided you agree to the *
#(C) following terms and conditions: *
#(C) 1. Redistributions of source code must retain the above copyright *
#(C) notice and this list of conditions. *
#(C) 2. Redistributions in binary form must reproduce the above copyright *
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#(C) other materials provided with the distribution. *
#(C) 3. All advertising materials mentioning features or use of this *
#(C) software must display the following acknowledgement: *
#(C) This product contains software from the Integrated Test and Operations *
#(C) System (ITOS), a satellite ground data system developed at the Goddard *
#(C) Space Flight Center in Greenbelt MD. *
#(C) *
#(C) This software is provided ‘‘as is’’ without any warranty of any kind, *
#(C) either express, implied, or statutory, including, but not limited to, *
#(C) any warranty that the software will conform to specification, any *
#(C) implied warranties of merchantability, fitness for a particular *
#(C) purpose, and freedom from infringement and any warranty that the *
#(C) documentation will conform to their program or will be error free. *
#(C) *
#(C) In no event shall NASA be liable for any damages, including, but not *
#(C) limited to, direct, indirect, special or consequential damages, *
#(C) arising out of, resulting from, or in any way connected with this *
#(C) software, whether or not based upon warranty, contract, tort, or *
#(C) otherwise, whether or not injury was sustained by persons or property *
#(C) or otherwise, and whether or not loss was sustained from or arose out *
#(C) of the results of, or use of, their software or services provided *
#(C) hereunder. *
#(C)*****

```

```
color default (LightBlue, default)
```

```

discrete fepid (
 WSGT_RTE (1,1,white,default)
 STGT_RTE (2,2,white,default)
 WSGT_PBE (3,3,white,default)
 STGT_PBE (4,4,white,default)
 SASS_RTE (5,5,white,default)
 SASS_PBE (6,6,white,default)
)

```

```

discrete fepmode (
 "" (0,0,default,default)
 PRIME (1,1,white,default)
 BACKUP (2,2,white,default)
)

```

```

)
(1,1, "Virtual Channel Master 0 1 2 3 \
 8 9 63")
(+,=, "-----"
-----")
(+,1, "frame counter ")
(+,=, "frames received ")
(+,=, "idle frames ")
(+,=, "TF version errs ")
(+,=, "s/c id errs ")
(+,=, "TF sequence errs")
(+,=, "TF CRC errs ")
(+,=, "TF corr R/S warn")
(+,=, "TF unco R/S errs")

gbl_tm_mc_fc (3, 19, ":v%8d:")
gbl_tm_mc_in (+, =, ":v%8d:")
gbl_tm_mc_idle (+, =, ":v%8d:")
gbl_tm_mc_vere (+, =, ":v%8d:")
gbl_tm_mc_side (+, =, ":v%8d:")
gbl_tm_mc_seqe (+, =, ":v%8d:")
gbl_tm_mc_crce (+, =, ":v%8d:")
gbl_tm_mc_rsc (+, =, ":v%8d:")
gbl_tm_mc_rse (+, =, ":v%8d:")

gbl_tm_vc_fc[0] (3, 29, ":v%8d:")
gbl_tm_vc_in[0] (+, =, ":v%8d:")
gbl_tm_vc_idle[0] (+, =, ":v%8d:")
gbl_tm_vc_vere[0] (+, =, ":v%8d:")
gbl_tm_vc_side[0] (+, =, ":v%8d:")
gbl_tm_vc_seqe[0] (+, =, ":v%8d:")
gbl_tm_vc_crce[0] (+, =, ":v%8d:")
gbl_tm_vc_rsc[0] (+, =, ":v%8d:")
gbl_tm_vc_rse[0] (+, =, ":v%8d:")

gbl_tm_vc_fc[1] (3, 39, ":v%8d:")
gbl_tm_vc_in[1] (+, =, ":v%8d:")
gbl_tm_vc_idle[1] (+, =, ":v%8d:")
gbl_tm_vc_vere[1] (+, =, ":v%8d:")
gbl_tm_vc_side[1] (+, =, ":v%8d:")
gbl_tm_vc_seqe[1] (+, =, ":v%8d:")
gbl_tm_vc_crce[1] (+, =, ":v%8d:")
gbl_tm_vc_rsc[1] (+, =, ":v%8d:")
gbl_tm_vc_rse[1] (+, =, ":v%8d:")

gbl_tm_vc_fc[2] (3, 49, ":v%8d:")
gbl_tm_vc_in[2] (+, =, ":v%8d:")

```

```

gbl_tm_vc_idle[2] (+, =, ":v%8d:")
gbl_tm_vc_vere[2] (+, =, ":v%8d:")
gbl_tm_vc_side[2] (+, =, ":v%8d:")
gbl_tm_vc_seqe[2] (+, =, ":v%8d:")
gbl_tm_vc_crce[2] (+, =, ":v%8d:")
gbl_tm_vc_rsc[2] (+, =, ":v%8d:")
gbl_tm_vc_rse[2] (+, =, ":v%8d:")

```

```

gbl_tm_vc_fc[3] (3, 59, ":v%8d:")
gbl_tm_vc_in[3] (+, =, ":v%8d:")
gbl_tm_vc_idle[3] (+, =, ":v%8d:")
gbl_tm_vc_vere[3] (+, =, ":v%8d:")
gbl_tm_vc_side[3] (+, =, ":v%8d:")
gbl_tm_vc_seqe[3] (+, =, ":v%8d:")
gbl_tm_vc_crce[3] (+, =, ":v%8d:")
gbl_tm_vc_rsc[3] (+, =, ":v%8d:")
gbl_tm_vc_rse[3] (+, =, ":v%8d:")

```

```

gbl_tm_vc_fc[8] (3, 69, ":v%8d:")
gbl_tm_vc_in[8] (+, =, ":v%8d:")
gbl_tm_vc_idle[8] (+, =, ":v%8d:")
gbl_tm_vc_vere[8] (+, =, ":v%8d:")
gbl_tm_vc_side[8] (+, =, ":v%8d:")
gbl_tm_vc_seqe[8] (+, =, ":v%8d:")
gbl_tm_vc_crce[8] (+, =, ":v%8d:")
gbl_tm_vc_rsc[8] (+, =, ":v%8d:")
gbl_tm_vc_rse[8] (+, =, ":v%8d:")

```

```

gbl_tm_vc_fc[9] (3, 79, ":v%8d:")
gbl_tm_vc_in[9] (+, =, ":v%8d:")
gbl_tm_vc_idle[9] (+, =, ":v%8d:")
gbl_tm_vc_vere[9] (+, =, ":v%8d:")
gbl_tm_vc_side[9] (+, =, ":v%8d:")
gbl_tm_vc_seqe[9] (+, =, ":v%8d:")
gbl_tm_vc_crce[9] (+, =, ":v%8d:")
gbl_tm_vc_rsc[9] (+, =, ":v%8d:")
gbl_tm_vc_rse[9] (+, =, ":v%8d:")

```

```

gbl_tm_vc_fc[63] (3, 89, ":v%8d:")
gbl_tm_vc_in[63] (+, =, ":v%8d:")
gbl_tm_vc_idle[63] (+, =, ":v%8d:")
gbl_tm_vc_vere[63] (+, =, ":v%8d:")
gbl_tm_vc_side[63] (+, =, ":v%8d:")
gbl_tm_vc_seqe[63] (+, =, ":v%8d:")
gbl_tm_vc_crce[63] (+, =, ":v%8d:")
gbl_tm_vc_rsc[63] (+, =, ":v%8d:")
gbl_tm_vc_rse[63] (+, =, ":v%8d:")

```

```

(3,98, "frms")
(+, =, "frms")

(12,1, "Archive totals ")
gbl_tm_arch_name[0] (=, +, ":v%11s:")
gbl_tm_arch_frms[5] (=, 29, ":v%8d:")
gbl_tm_arch_frms[4] (=, 39, ":v%8d:")
gbl_tm_arch_frms[3] (=, 49, ":v%8d:")
gbl_tm_arch_frms[2] (=, 59, ":v%8d:")
gbl_tm_arch_frms[1] (=, 69, ":v%8d:")
gbl_tm_arch_frms[0] (=, 79, ":v%8d:")
(=, 98, "frms")

(+2,1, "Disk Free Space ")
gbl_tm_arch_free (=, +, ":v%8d: :u:")
gbl_fep_id (=,82, ":v%-8s:", fepid)
gbl_fep_mode (=, +, " :v%6s:", fepmode)
(+, 1, "Frame Input Rate ")
gbl_tm_frmrate (=, +, ":v%8.3f: :u:")
GBL_GMTOFF (=,82, ":v%15T:")
(=, +, " GMT")

```

## B.6 gfep/procs directory

The *PROCS* directory is reserved for user supplied ITOS procs that the MOC may add at a later time. It may not exist and if it does it will be empty.

- <empty>

## Appendix C GFEP Runtime Variables

The following section documents the the runtime environment that controls the GFEP operation. Some items as noted can be changed on the running system and other can only be changed in the outside environment prior to ITOS starting. Changes at this level are for the MOC personnel to decide when to make and extreme care should be taken before making changes to the delivered configuration.

### C.1 Shell Environments Variables, STOL Variables and Mnemonics

The `gfep_setup` proc is the main work horse of the Glast Front End Processor. It is started by `gfep_start` proc in a continuous loop for each pass. It makes connections with the MOC and starts/stops and controls the `frame_sorter` and `FrameSync` programs. The proc runs in 2 modes based on the `gbl_fep_id` mnemonic state of realtime or playback element.

Realtime elements (RTE) do the following:

0. Check for low disk pass and remove archive directories older than `arch_days_to_keep`.
1. If `gbl_stolwkp` is not 0 then start a relay program to connect the STOL well known port as a client to connect to MOC.
2. Start an `itos_report_status` task as a client to connect to MOC.
3. Start/control `frame_sorter` task passing commands to open archives for predetermined VCs.
4. Start `FrameSync` task programmed with Glast parameters using a fifo to pass completed frames to the `frame_sorter` with SMEX (aka `leo-t`) headers attached. Raw data will be saved to 1 GB enumerated files.
5. Control `frame_sorter` start sending input selected VCs as a client to connect to MOC.  
If this is the BACKUP RTE(spare) the MOC connection is not made.
6. Wait for `FrameSync` LOS.
7. Kill or close STOL relay, `FrameSync` and `frame_sorter` tasks.
8. Perform post pass activities including writing pass statistics into event log
9. Kill `itos_report_status` task.
10. Cleanup archive directory including renaming archive directory/files using actual AOS time and `gzip` raw data files.
11. On Exit, all external programs and connections have been terminated.

Playback elements (PBE) do the following:

0. Check for low disk pass and remove archive directories older than `arch_days_to_keep`.
1. Start an `itos_report_status` task as a server on the input selected port for MOC to connect to.
2. Start/control `frame_sorter` task passing commands to open archives for predetermined VCs.

3. Start FrameSync task programmed with Glast parameters using a fifo to pass completed frames to the frame\_sorter with LEOt headers attached. Raw data will be saved to 1 GB enumerated files.
4. Wait for FrameSync LOS.
5. Kill or close FrameSync and frame\_sorter tasks.
6. Perform post pass activities including writing pass statistics into event log.
7. Cleanup archive directory including renaming archive directory/files using actual AOS time and gzip raw data files.
8. Configure fastcopy with an input specified ordered list of files to be sent via fcopy to the MOC in a batch job. After completion the fastcopy log is fastcopy'd to the MOC.
9. Kill itos\_report\_status task.
10. On Exit, all external programs and connections have been terminated.

## Global Mnemonics:

```

gbl_fcopyhost : moc workstation for PBE files FastCopy'd
gbl_fcopyport : moc workstation port for PBE files FastCopy'd
gbl_fcopyuser : moc workstation user name for FastCopy. If empty
 : user comes from .netrc file in /home/gfep.
gbl_fcopypwd : moc workstation user password for FastCopy. If empty
 : password comes from .netrc file in /home/gfep.
gbl_fcopydir : moc workstation base directory for FastCopy
gbl_fcopyorder : array file list used for FastCopy
gbl_fcopyrate : maximum bandwidth FastCopy allowed to use. Can be
 : a percent, ie '50%' or a rate, i.e '5Mb'.
gbl_fep_id : 1="WSGT_RTE",2="STGT_RTE",3="WSGT_PBE",4="STGT_PBE"
 : 5="SASS_RTE",6="SASS_PBE"
gbl_fep_mode : 1="PRIME", 2="BACKUP"
gbl_fep_error : return status string to MOC from this proc
gbl_fep_act_aos : actual AOS time
gbl_fep_exp_aos : expected AOS time
gbl_fep_act_los : actual LOS time
gbl_fep_exp_los : expected AOS time
gbl_fep_storeraw : indicates whether FrameSync is to log raw frames.
gbl_fep_sysdone : used to make for system calls to complete
gbl_frmsync_chan : which edt channel got selected
gbl_frmsync_bytes : frame sync byte count zeroed at startup of proc
gbl_moc_vcs : which VCs we send to MOC
gbl_moclevtport : main moc workstation port for event messages
gbl_moc1host : main moc workstation host
gbl_moc1port : main moc workstation port
gbl_moc1retry : main moc workstation number of connection retries
gbl_moc1statport : main moc workstation port to send status packets
gbl_moc1stolport : main moc workstation port to get STOL directives

```

```

gbl_moc1timeo : main moc workstation connection timeout interval
gbl_moc2evtport : alternate moc workstation port for event messages
gbl_moc2host : alternate moc workstation host if any
gbl_moc2port : alternate moc workstation port if any
gbl_moc2retry : alternate moc workstation number of connect retries
gbl_moc2statport : alternate moc workstation port to send status packets
gbl_moc2stolport : alternate moc workstation port to get STOL directives
gbl_moc2timeo : alternate moc workstation connection timeout interval
gbl_moc_cycles : how many times to cycle between moc1 and moc2
gbl_moc_statint : delay in seconds between MOC status packets
gbl_tm_archdir : output archive root directory
gbl_tm_arch_free : free MB of disk space on archive partition

```

## Local STOL variables:

```

acpass : pass name derived from gbl_gmtoff
 : in form of yyyyjjhhmm.
acpass1 : same as acpass except after actual AOS occurs.
archdir : full qualified archive directory name
chan_opts : channel args string to be passed to FrameSync
 : derived from global edt_chan if it exists.
ctrl_unit : STOL unit number to open for frame_sorter control
ctrl_port : port opened to frame_sorter to control & status
duration : used as derived value for AOS/LOS waits
exp_aos : assigned from mnemonic gbl_fep_exp_aos
exp_los : assigned from mnemonic gbl_fep_exp_los
fcopy_user : user name/password combo used in fcopy invoke
 : and any extra args from env var "GFEP_FCOPY_XTRA"
fsync_pid : process id of FrameSync program from system call
fsorter_pid : process id of frame_sorter program from system call
i_am_rte : derived from gbl_fep_id
i_am_sass : Spectrum Astro I&T derived from gbl_fep_id
leadin : a lead in identifier string to indicate the source
 : of fcopy'd files to the MOC of the form
 : "GFxx_" where xx is WS, ST, or SA.
moc_ac_options : built up string for "ac" directive to frame_sorter
 : If empty, default is max disk space.
raw_opts : built up string for raw file options for FrameSync
remainder : holds remainder of line on STOL read
report_appid : packet ID used by the itos_report_status program
report_pid : process id of itos_report_status program from
 : system call
report_options : built up string for itos_report_status program
 : for socket setup arguments.
resp : holds response from frame_sorter after write
stol_pid : process id of stol replay program from system call
stol_relay_options : built up string for stol relay to MOC

```

```

write_return : set to return label to be used by write_test
 to act as pseudo gosub and return.

```

global STOL variables:

```

arch_days_to_keep : any archive older will be removed.
 default = 7 unless overridden by environment
 variable "GFEP_ARCH_DAYS". If zero then archives
 are never removed.
bitslip : option read from env var "GFEP_FEP_BITSLIP"
 sets the max allowed bit slips, default 3
fcopy_extra : Extra arguments passed to fastcopy such as
 encryption set from env var "GFEP_FCOPY_XTRA"
fifo : string name of fifo to send FrameSync to send
 telemetry to frame_sorter
gzip_raw : set from env var "GFEP_GZIP_RAW" if non-null
 decides whether raw files are gzip'd post pass.
moc_ac_maxque : option read from env var "GFEP_MOC_MAXQUE" sets
 the max queue size for #frames to back up to MOC.
sync_stat : holds status from wait for FrameSync to start
sorter_stat : holds status from wait for frame_sorter to start

```

Shell Environment variables set in 'itosrc' file that can't be changed once ITOS starts:

```

GFEP_ARCH_DAYS : number of days to retain archive directories
 overrides global arch_days_to_keep if exists.
 This would reside in the itosrc file.
ITOS_FOPFIFODIR : directory where the fifo is created that is used
 to pass frames between FrameSync and frame_sorter
 programs.
GFEP_MOC_MAXQUE : if present sets the max number of frames the
 frame sorter will back buffer to the moc
 otherwise it is unlimited.
GFEP_FEP_BITSLIP : if present sets the number of allowable bit
 frame sync slips before out-of-lock occurs.
GFEP_GZIP_RAW : If present and non-null then raw files are
 gzip'd at end of pass otherwise they are not.
GFEP_FCOPY_XTRA : Extra arguments passed to fastcopy such as
 encryption.

```

## C.2 GFEP Mnemonics and Packet definitions

GFEP Mnemonics and Packet definitions are included with the ITOS software file 'dbx/fep.dbx-opt' and are used by the GFEP to control runtime operations and defines the format of status packets sent to the MOC as shown in the following extract:

```

DEL,|

```

```

SSI|ITOS_FEP|+|
 "<html>Control/Status Mnemonics of the ITOS
 telemetry subsystem front end processor."

TLM|GBL_FEP_SYSDONE|+||ITOS_FEP|U||||1||||F|
 "Used as a flag in system calls to signal FEP procs."

TLM|GBL_FEP_STORERAW|+||ITOS_FEP|U||||1||||1|F|
 "Used FEP procs to turn raw frame logging on/off."

TLM|GBL_FEP_ERROR|+||ITOS_FEP|S|100||||1||||F|
 "Indicates an error condition of the FEP procs.
 <html>Intended to be sent to the MOC in a status packet."

TLM|GBL_FEP_RAIDSTAT|+||ITOS_FEP|S|100||||1||||F|
 "Indicates an disk raid condition on the FEP.
 <html>Intended to be sent to the MOC in a status packet."

DSC|GBL_FEPID_DSC|"UNASSIGNED" |+| 0 | 0 |
DSC|GBL_FEPID_DSC|"WSGT_RTE" |+| 1 | 1 |
DSC|GBL_FEPID_DSC|"STGT_RTE" |+| 2 | 2 |
DSC|GBL_FEPID_DSC|"WSGT_PBE" |+| 3 | 3 |
DSC|GBL_FEPID_DSC|"STGT_PBE" |+| 4 | 4 |
DSC|GBL_FEPID_DSC|"SASS_RTE" |+| 5 | 5 |
DSC|GBL_FEPID_DSC|"SASS_PBE" |+| 6 | 6 |
DSC|GBL_FEPID_DSC|"UNASSIGNED" |+| 7 | 255 |

TLM|GBL_FEP_ID|+||ITOS_FEP|U|8|||1||GBL_FEPID_DSC|0|T|
 "Front End Processor ID used by FEP procs.
 <html>Indicates the source and type of Front End Processor:

 UNASSIGNED (no ID assigned)
 WSGT_RTE (White Sands Ground Terminal / Real Time Element)
 STGT_RTE (Second TDRSS Ground Terminal / Real Time Element)
 WSGT_PBE (White Sands Ground Terminal / Playback Element)
 STGT_PBE (Second TDRSS Ground Terminal / Playback Element)
 SASS_RTE (Spectrum Astro I&T Facility / Real Time Element)
 SASS_PBE (Spectrum Astro I&T Facility / Playback Element)

 <p>
 This mnemonic was designed to control the FEP procs based on what
 station it comes from and whether the machine is functioning as a
 RTE or a PBE. It is expected to be set in the itosrc file. The
 length and format of the discrete conversion must follow the format
 XXXX_YYY where XXXX is the facility and YYY must be RTE or PBE
 otherwise the controlling FEP proc will not work properly."

```

|                                  |   |   |  |     |  |
|----------------------------------|---|---|--|-----|--|
| DSC GBL_FEPMODE_DSC "UNASSIGNED" | + | 0 |  | 0   |  |
| DSC GBL_FEPMODE_DSC "PRIME"      | + | 1 |  | 1   |  |
| DSC GBL_FEPMODE_DSC "BACKUP"     | + | 2 |  | 2   |  |
| DSC GBL_FEPMODE_DSC "UNASSIGNED" | + | 3 |  | 255 |  |

TLM|GBL\_FEP\_MODE|+||ITOS\_FEP|UB|8|||1||GBL\_FEPMODE\_DSC|0|F|  
 "Front End Processor MODE used by FEP procs.  
 <html>This indicates the Front End Processor mode:  
 <ul>  
 <li>UNASSIGNED (no ID assigned)  
 <li>PRIME (this host is prime)  
 <li>BACKUP (this host is backup)  
 </ul>  
 <p>  
 This status designed to be used by a Front End Processor that  
 is running as a playback element where <a href=\"GBL\_FEP\_ID.html\">  
 <var><font size=\"-1\">GBL\_FEP\_ID</font></var></a> is 3, 4, or 6  
 to indicate which host will send archives to the MOC after the pass."

TLM|GBL\_FEP\_ACT\_AOS|+||ITOS\_FEP|TIME42|||1|||F|  
 "Actual Front End Processor AOS time."

TLM|GBL\_FEP\_EXP\_AOS|+||ITOS\_FEP|TIME42|||1|||F|  
 "Expected Front End Processor AOS time."

TLM|GBL\_FEP\_ACT\_LOS|+||ITOS\_FEP|TIME42|||1|||F|  
 "Actual Front End Processor LOS time."

TLM|GBL\_FEP\_EXP\_LOS|+||ITOS\_FEP|TIME42|||1|||F|  
 "Expected Front End Processor LOS time."

TLM|GBL\_MOC\_VCS|+||ITOS\_FEP|CHAR|100|||1|||F|  
 "Selects which VCs from the FEP stream are sent to the MOC.  
 <html>Used by the gfep\_setup proc to determine which VCs  
 the frame sorter will be programmed to forward to the MOC.  
 <p>Only valid if <a href=\"GBL\_MOC1HOST.html\">  
 <var><font size=\"-1\">GBL\_MOC1HOST</font></var></a> is not blank."

TLM|GBL\_MOC1HOST|+||ITOS\_FEP|CHAR|100|||1|||F|  
 "Main MOC workstation for R/T telemetry.  
 <html>Used by the gfep\_setup proc to determine which MOC host  
 if any will be forwarded realtime VCs from the front end processor.  
 If blank, no VCs are forwarded. This used in conjunction with  
 the alternate MOC workstation host <a href=\"GBL\_MOC2HOST.html\">  
 <var><font size=\"-1\">GBL\_MOC2HOST</font></var></a>.  
 Also see <a href=\"GBL\_MOC1PORT.html\">  
 <var><font size=\"-1\">GBL\_MOC1PORT</font></var></a>,"

```


<var>GBL_MOC1RETRY</var>,

<var>GBL_MOC1TIMEO</var> and

<var>GBL_MOC_CYCLES</var>.
<p>Only valid if
<var>GBL_MOC_VCS</var> is not blank."

```

```

TLM|GBL_MOC1PORT|+||ITOS_FEP|U||||1|||0|F|
"Main MOC workstation port for R/T telemetry.
<html>Used by the gfep_setup proc to determine which MOC
host port
if any will be forwarded realtime VCs from the front end processor.
<p>Only valid if
<var>GBL_MOC1HOST</var> is not blank."

```

```

TLM|GBL_MOC1RETRY|+||ITOS_FEP|U||||1|||1|F|
"Main MOC workstation R/T telemetry retry count.
<html>Used by the gfep_setup proc to determine how many times to
try to connect to the main MOC workstation
<var>GBL_MOC1HOST</var> before
giving up. See
<var>GBL_MOC1TIMEO</var> for the timeout
interval in seconds between retries.
<p>Only valid if
<var>GBL_MOC1HOST</var> is not blank."

```

```

TLM|GBL_MOC1TIMEO|+||ITOS_FEP|U||Secs||1|||5|F|
"Main MOC workstation R/T telemetry timeout interval.
<html>Used by the gfep_setup proc to determine how long to wait
in seconds between retrying connections to the main MOC workstation

<var>GBL_MOC1HOST</var>. See

<var>GBL_MOC1RETRY</var> for the maximum
number of retries.
<p>Only valid if
<var>GBL_MOC1HOST</var> is not blank."

```

```

TLM|GBL_MOC1STATPORT|+||ITOS_FEP|U||||1|||0|F|
"Main MOC workstation port to receive fep status packets.
<html>Used by the gfep_setup proc to determine which MOC
host port
if any will be forwarded fep status packets from the front end processor.
<p>Only valid if
<var>GBL_MOC1HOST</var> is not blank."

```

```

TLM|GBL_MOC1STOLPORT|+||ITOS_FEP|U||||1|||0|F|
 "Main MOC workstation port to connect to fep STOL WKP.
 <html>Used by the gfep_setup proc to determine which MOC
 host port
 if any will be used to connect MOC to the front end processor's
 STOL Well-Known-Port to receive STOL directives.
 <p>Only valid if
 <var>GBL_MOC1HOST</var> is not blank."

TLM|GBL_MOC1EVTPORT|+||ITOS_FEP|U||||1|||0|F|
 "Main MOC workstation port used to receive fep event messages.
 <html>Used by the gfep_setup proc to determine which MOC
 host port
 if any will be forwarded fep status packets from the front end processor.
 <p>Only valid if
 <var>GBL_MOC1HOST</var> is not blank."

TLM|GBL_MOC2HOST|+||ITOS_FEP|CHAR|100||||1|||F|
 "Alternate MOC workstation for R/T telemetry.
 <html>Used by the gfep_setup proc to determine which MOC host
 if any will be forwarded realtime VCs from the front end processor
 in the event
 <var>GBL_MOC1HOST</var> doesn't respond.
 If blank, there is no alternate MOC host. Also see

 <var>GBL_MOC2PORT</var>,

 <var>GBL_MOC2RETRY</var>,

 <var>GBL_MOC2TIMEO</var> and

 <var>GBL_MOC_CYCLES</var>.
 <p>Only valid if <var>GBL_MOC1HOST</var>
 is not blank."

TLM|GBL_MOC2PORT|+||ITOS_FEP|U||||1|||0|F|
 "Alternate MOC workstation port for R/T telemetry.
 <html>Used by the gfep_setup proc to determine which MOC
 host port
 if any will be forwarded realtime VCs from the front end processor
 in the event the main MOC workstation
 <var>GBL_MOC1HOST</var> doesn't respond.
 <p>Only valid if
 <var>GBL_MOC2HOST</var> is not blank."

TLM|GBL_MOC2RETRY|+||ITOS_FEP|U||||1|||1|F|

```

"Alternate MOC workstation R/T telemetry retry count.  
 <html>Used by the gfep\_setup proc to determine how many times to try to connect to the main MOC workstation <a href=\"GBL\_MOC2HOST.html\"><var><font size=\"-1\">GBL\_MOC2HOST</font></var></a> before giving up. See <a href=\"GBL\_MOC2TIMEO.html\"><var><font size=\"-1\">GBL\_MOC2TIMEO</font></var></a> for the timeout interval in seconds between retries.  
 <p>Only valid if <a href=\"GBL\_MOC2HOST.html\"><var><font size=\"-1\">GBL\_MOC2HOST</font></var></a> is not blank."

TLM|GBL\_MOC2TIMEO|+||ITOS\_FEP|U||Secs||1||5|F|

"Alternate MOC workstation R/T telemetry timeout interval.  
 <html>Used by the gfep\_setup proc to determine how long to wait in seconds between retrying connections to the alternate MOC workstation <a href=\"GBL\_MOC2HOST.html\"><var><font size=\"-1\">GBL\_MOC2HOST</font></var></a>. See <a href=\"GBL\_MOC2RETRY.html\"><var><font size=\"-1\">GBL\_MOC2RETRY</font></var></a> for the maximum number of retries.  
 <p>Only valid if <a href=\"GBL\_MOC2HOST.html\"><var><font size=\"-1\">GBL\_MOC2HOST</font></var></a> is not blank."

TLM|GBL\_MOC2STATPORT|+||ITOS\_FEP|U||||1||0|F|

"Alternate MOC station port to receive fep status packets.  
 <html>Used by the gfep\_setup proc to determine which MOC <a href=\"GBL\_MOC2HOST.html\">host</a> port if any will be forwarded fep status packets from the front end processor.  
 <p>Only valid if <a href=\"GBL\_MOC2HOST.html\"><var><font size=\"-1\">GBL\_MOC2HOST</font></var></a> is not blank."

TLM|GBL\_MOC2STOLPORT|+||ITOS\_FEP|U||||1||0|F|

"Alternate MOC workstation port to connect to fep STOL WKP.  
 <html>Used by the gfep\_setup proc to determine which MOC <a href=\"GBL\_MOC2HOST.html\">host</a> port if any will be used to connect MOC to the front end processor's STOL Well-Known-Port to receive STOL directives.  
 <p>Only valid if <a href=\"GBL\_MOC2HOST.html\"><var><font size=\"-1\">GBL\_MOC2HOST</font></var></a> is not blank."

TLM|GBL\_MOC2EVTPORT|+||ITOS\_FEP|U||||1||0|F|

"Alternate MOC workstation port to receive fep event messages.  
 <html>Used by the gfep\_setup proc to determine which MOC <a href=\"GBL\_MOC2HOST.html\">host</a> port if any will be forwarded fep status packets from the front end processor.  
 <p>Only valid if <a href=\"GBL\_MOC2HOST.html\"><var><font size=\"-1\">GBL\_MOC2HOST</font></var></a> is not blank."

```
TLM|GBL_MOC_CYCLES|+||ITOS_FEP|U||||1|||1|F|
 "Number of times to retry connections to main/alternate MOC hosts.
 <html>Used by the gfep_setup proc to determine how many times to
 try cycling between the main and alternate MOC workstation

 (<var>GBL_MOC1HOST</var> and

 <var>GBL_MOC2HOST</var>
 connections before giving up.
 <p>If
 <var>GBL_MOC2HOST</var> is blank
 then only <var>GBL_MOC1HOST</var>
 is cycled."
```

```
TLM|GBL_MOC_STATINT|+||ITOS_FEP|U||SEC||1|||10|F|
 "Interval in seconds between Status Packets sent to MOC hosts.
 <html>Used by the gfep_setup proc to determine how often to send
 report status packets to main/alternate MOC workstation

 (<var>GBL_MOC1HOST</var> or

 <var>GBL_MOC2HOST</var>.
 <p>Only valid if
 <var>GBL_MOC1HOST</var> is not blank."
```

```
TLM|GBL_FCOPYHOST|+||ITOS_FEP|CHAR|100|||1|||F|
 "MOC workstation to receive FastCopy P/B files.
 <html>Used by the gfep_setup proc to determine which MOC host
 if any will be forwarded playback VC files from the front end processor.
 If blank, no VCs are transferred.
 Also see
 <var>GBL_FCOPYPORT</var> and

 <var>GBL_FCOPYPWD</var> and

 <var>GBL_FCOPYUSER</var> and

 <var>GBL_FCOPYDIR</var> and

 <var>GBL_FCOPYRATE</var>."
```

```
TLM|GBL_FCOPYPORT|+||ITOS_FEP|U||||1|||5745|F|
 "MOC workstation port to receive FastCopy P/B files.
 <html>Used by the gfep_setup proc to determine which MOC port
 if any will be forwarded playback VC files from the front end processor.
 Preset to factory default of 5745.
 Also see
```

```

<var>GBL_FCOPYHOST</var>."

TLM|GBL_FCOPYUSER|+||ITOS_FEP|CHAR|100|||1|||F|
"FastCopy user name on MOC host to receive P/B files.
<html>Used by the gfep_setup proc to determine which user account
name is coded into the fcopy system directive.
Also see
<var>GBL_FCOPYHOST</var> and

<var>GBL_FCOPYPWD</var>."

TLM|GBL_FCOPYPWD|+||ITOS_FEP|CHAR|100|||1|||F|
"FastCopy user password on MOC host to receive P/B files.
<html>Used by the gfep_setup proc to determine which user account
name is coded into the fcopy system directive.
Also see
<var>GBL_FCOPYHOST</var> and

<var>GBL_FCOPYUSER</var>."

TLM|GBL_FCOPYDIR|+||ITOS_FEP|CHAR|100|||1|||F|
"Directory on MOC host to play FastCopy P/B files.
<html>Used by the gfep_setup proc to determine which base directory
on MOC host to FastCopy playback files from PBE.
Also see
<var>GBL_FCOPYHOST</var>."

TLM|GBL_FCOPYRATE|+||ITOS_FEP|CHAR|20|||1|||"100%"|F|
"Allowable FastCopy output rate.
<html>Parameter used to pass to FastCopy for maximum output
network bandwidth to consume transferring files from PBE. Format can be a
percentage or a rate in the form of
nnn.nnn[% | [K | M][B | b]] where K is kilo, M is mega,
B is byte and b is bits per second. Default is in
bits per second.
Also see
<var>GBL_FCOPYHOST</var>."

TLM|GBL_FCOPYORDER|+||ITOS_FEP|CHAR|20|||64|||F|
"Order of files to be FastCopy'd by the PBE to MOC.
<html>Array of partial file specs to be used by the gfep_setup proc
to determine order of files to be FastCopy'd to the MOC from the prime
PBE post pass.
Also see
<var>GBL_FCOPYHOST</var>."

#

```

```

Define the status packets which may be sent by itos_reports_status.
#

t1m|gbl_fep_time|+||itos_fep|time44|||||||"Current front-end time"
t1m|gbl_fep_epoch|+||itos_fep|time44||||||70-001-00:00:00.1000000||
"Front-end time epoch"

map|2031|+||itos_fep||gbl_fep_time|"Front-end processor status and statistics"
pkt|2031|gbl_fep_time||+||time44|6||gbl_fep_epoch

frame sync statistics

pkt|2031|gbl_frmsync_stat||+||u1234|16
pkt|2031|gbl_frmsync_cnt||+||u1234|20
pkt|2031|gbl_frmsync_drop||+||u1234|24
pkt|2031|gbl_frmsync_overrun||+||u1234|28
pkt|2031|gbl_frmsync_fps||+||f1234|32
pkt|2031|gbl_frmsync_bytes||+||f12345678|36
pkt|2031|gbl_frmsync_sbytes||+||f12345678|44
pkt|2031|gbl_frmsync_chan||+||u1234|52
pkt|2031|gbl_frmsync_inv||+||u1234|56

frame_sorter statistics

pkt|2031|gbl_tm_frmrate||+||f12345678|60
pkt|2031|gbl_tm_mc_fc||+||u1234|68
pkt|2031|gbl_tm_mc_in||+||u1234|72
pkt|2031|gbl_tm_mc_rej||+||u1234|76
pkt|2031|gbl_tm_mc_idle||+||u1234|80
pkt|2031|gbl_tm_mc_vere||+||u1234|84
pkt|2031|gbl_tm_mc_side||+||u1234|88
pkt|2031|gbl_tm_mc_seqe||+||u1234|92
pkt|2031|gbl_tm_mc_crce||+||u1234|96
pkt|2031|gbl_tm_mc_rse||+||u1234|100
pkt|2031|gbl_tm_mc_rsc||+||u1234|104
pkt|2031|gbl_tm_vc_fc||+||u1234|108
pkt|2031|gbl_tm_vc_in||+||u1234|364
pkt|2031|gbl_tm_vc_rej||+||u1234|620
pkt|2031|gbl_tm_vc_idle||+||u1234|876
pkt|2031|gbl_tm_vc_vere||+||u1234|1132
pkt|2031|gbl_tm_vc_side||+||u1234|1388
pkt|2031|gbl_tm_vc_seqe||+||u1234|1644
pkt|2031|gbl_tm_vc_crce||+||u1234|1900
pkt|2031|gbl_tm_vc_rse||+||u1234|2156
pkt|2031|gbl_tm_vc_rsc||+||u1234|2412
pkt|2031|gbl_tm_arch_free||+||u1234|2668
pkt|2031|gbl_tm_arch_frms||+||u1234|2672

```

```

pkt|2031|gbl_tm_arch_name||+||S1|2928

fep proc variables

pkt|2031|gbl_fep_error||+||s1|3952
pkt|2031|gbl_fep RAIDstat||+||s1|4052
pkt|2031|gbl_fep_id||+||u1|4152
pkt|2031|gbl_fep_mode||+||u1|4153
pkt|2031|gbl_fep_act_aos||+||time42|4154
pkt|2031|gbl_fep_exp_aos||+||time42|4160
pkt|2031|gbl_fep_act_los||+||time42|4166
pkt|2031|gbl_fep_exp_los||+||time42|4172

map|2032|+|itos_fep|||gbl_fep_time|"Front-end processor status and statistics"
pkt|2032|gbl_fep_time||+||time44|6||gbl_fep_epoch

frame sync statistics

pkt|2032|gbl_frmsync_stat||+||u1234|16
pkt|2032|gbl_frmsync_cnt||+||u1234|20
pkt|2032|gbl_frmsync_drop||+||u1234|24
pkt|2032|gbl_frmsync_overrun||+||u1234|28
pkt|2032|gbl_frmsync_fps||+||f1234|32
pkt|2032|gbl_frmsync_bytes||+||f12345678|36
pkt|2032|gbl_frmsync_sbytes||+||f12345678|44
pkt|2032|gbl_frmsync_chan||+||u1234|52
pkt|2032|gbl_frmsync_inv||+||u1234|56

frame_sorter statistics

pkt|2032|gbl_tm_frmrate||+||f12345678|60
pkt|2032|gbl_tm_mc_fc||+||u1234|68
pkt|2032|gbl_tm_mc_in||+||u1234|72
pkt|2032|gbl_tm_mc_rej||+||u1234|76
pkt|2032|gbl_tm_mc_idle||+||u1234|80
pkt|2032|gbl_tm_mc_vere||+||u1234|84
pkt|2032|gbl_tm_mc_side||+||u1234|88
pkt|2032|gbl_tm_mc_seqe||+||u1234|92
pkt|2032|gbl_tm_mc_crce||+||u1234|96
pkt|2032|gbl_tm_mc_rse||+||u1234|100
pkt|2032|gbl_tm_mc_rsc||+||u1234|104
pkt|2032|gbl_tm_vc_fc||+||u1234|108
pkt|2032|gbl_tm_vc_in||+||u1234|364
pkt|2032|gbl_tm_vc_rej||+||u1234|620
pkt|2032|gbl_tm_vc_idle||+||u1234|876

```

```

pkt|2032|gbl_tm_vc_vere||+||u1234|1132
pkt|2032|gbl_tm_vc_side||+||u1234|1388
pkt|2032|gbl_tm_vc_seqe||+||u1234|1644
pkt|2032|gbl_tm_vc_crce||+||u1234|1900
pkt|2032|gbl_tm_vc_rse||+||u1234|2156
pkt|2032|gbl_tm_vc_rsc||+||u1234|2412
pkt|2032|gbl_tm_arch_free||+||u1234|2668
pkt|2032|gbl_tm_arch_frms||+||u1234|2672
pkt|2032|gbl_tm_arch_name||+||S1|2928

fep proc variables

pkt|2032|gbl_fep_error||+||s1|3952
pkt|2032|gbl_fep RAIDstat||+||s1|4052
pkt|2032|gbl_fep_id||+||u1|4152
pkt|2032|gbl_fep_mode||+||u1|4153
pkt|2032|gbl_fep_act_aos||+||time42|4154
pkt|2032|gbl_fep_exp_aos||+||time42|4160
pkt|2032|gbl_fep_act_los||+||time42|4166
pkt|2032|gbl_fep_exp_los||+||time42|4172

map|2033|+|itos_fep|||gbl_fep_time|"Front-end processor status and statistics"
pkt|2033|gbl_fep_time||+||time44|6||gbl_fep_epoch

frame sync statistics

pkt|2033|gbl_frmsync_stat||+||u1234|16
pkt|2033|gbl_frmsync_cnt||+||u1234|20
pkt|2033|gbl_frmsync_drop||+||u1234|24
pkt|2033|gbl_frmsync_overrun||+||u1234|28
pkt|2033|gbl_frmsync_fps||+||f1234|32
pkt|2033|gbl_frmsync_bytes||+||f12345678|36
pkt|2033|gbl_frmsync_sbytes||+||f12345678|44
pkt|2033|gbl_frmsync_chan||+||u1234|52
pkt|2033|gbl_frmsync_inv||+||u1234|56

frame_sorter statistics

pkt|2033|gbl_tm_frmrate||+||f12345678|60
pkt|2033|gbl_tm_mc_fc||+||u1234|68
pkt|2033|gbl_tm_mc_in||+||u1234|72
pkt|2033|gbl_tm_mc_rej||+||u1234|76
pkt|2033|gbl_tm_mc_idle||+||u1234|80
pkt|2033|gbl_tm_mc_vere||+||u1234|84
pkt|2033|gbl_tm_mc_side||+||u1234|88

```

```

pkt|2033|gbl_tm_mc_seqe||+||u1234|92
pkt|2033|gbl_tm_mc_crce||+||u1234|96
pkt|2033|gbl_tm_mc_rse||+||u1234|100
pkt|2033|gbl_tm_mc_rsc||+||u1234|104
pkt|2033|gbl_tm_vc_fc||+||u1234|108
pkt|2033|gbl_tm_vc_in||+||u1234|364
pkt|2033|gbl_tm_vc_rej||+||u1234|620
pkt|2033|gbl_tm_vc_idle||+||u1234|876
pkt|2033|gbl_tm_vc_vere||+||u1234|1132
pkt|2033|gbl_tm_vc_side||+||u1234|1388
pkt|2033|gbl_tm_vc_seqe||+||u1234|1644
pkt|2033|gbl_tm_vc_crce||+||u1234|1900
pkt|2033|gbl_tm_vc_rse||+||u1234|2156
pkt|2033|gbl_tm_vc_rsc||+||u1234|2412
pkt|2033|gbl_tm_arch_free||+||u1234|2668
pkt|2033|gbl_tm_arch_frms||+||u1234|2672
pkt|2033|gbl_tm_arch_name||+||S1|2928

fep proc variables

pkt|2033|gbl_fep_error||+||s1|3952
pkt|2033|gbl_fep_raidstat||+||s1|4052
pkt|2033|gbl_fep_id||+||u1|4152
pkt|2033|gbl_fep_mode||+||u1|4153
pkt|2033|gbl_fep_act_aos||+||time42|4154
pkt|2033|gbl_fep_exp_aos||+||time42|4160
pkt|2033|gbl_fep_act_los||+||time42|4166
pkt|2033|gbl_fep_exp_los||+||time42|4172

map|2034|+|itos_fep|||gbl_fep_time|"Front-end processor status and statistics"
pkt|2034|gbl_fep_time||+||time44|6||gbl_fep_epoch

frame sync statistics

pkt|2034|gbl_frmsync_stat||+||u1234|16
pkt|2034|gbl_frmsync_cnt||+||u1234|20
pkt|2034|gbl_frmsync_drop||+||u1234|24
pkt|2034|gbl_frmsync_overrun||+||u1234|28
pkt|2034|gbl_frmsync_fps||+||f1234|32
pkt|2034|gbl_frmsync_bytes||+||f12345678|36
pkt|2034|gbl_frmsync_sbytes||+||f12345678|44
pkt|2034|gbl_frmsync_chan||+||u1234|52
pkt|2034|gbl_frmsync_inv||+||u1234|56

frame_sorter statistics

```

```

pkt|2034|gbl_tm_frmrate||+||f12345678|60
pkt|2034|gbl_tm_mc_fc||+||u1234|68
pkt|2034|gbl_tm_mc_in||+||u1234|72
pkt|2034|gbl_tm_mc_rej||+||u1234|76
pkt|2034|gbl_tm_mc_idle||+||u1234|80
pkt|2034|gbl_tm_mc_vere||+||u1234|84
pkt|2034|gbl_tm_mc_side||+||u1234|88
pkt|2034|gbl_tm_mc_seqe||+||u1234|92
pkt|2034|gbl_tm_mc_crce||+||u1234|96
pkt|2034|gbl_tm_mc_rse||+||u1234|100
pkt|2034|gbl_tm_mc_rsc||+||u1234|104
pkt|2034|gbl_tm_vc_fc||+||u1234|108
pkt|2034|gbl_tm_vc_in||+||u1234|364
pkt|2034|gbl_tm_vc_rej||+||u1234|620
pkt|2034|gbl_tm_vc_idle||+||u1234|876
pkt|2034|gbl_tm_vc_vere||+||u1234|1132
pkt|2034|gbl_tm_vc_side||+||u1234|1388
pkt|2034|gbl_tm_vc_seqe||+||u1234|1644
pkt|2034|gbl_tm_vc_crce||+||u1234|1900
pkt|2034|gbl_tm_vc_rse||+||u1234|2156
pkt|2034|gbl_tm_vc_rsc||+||u1234|2412
pkt|2034|gbl_tm_arch_free||+||u1234|2668
pkt|2034|gbl_tm_arch_frms||+||u1234|2672
pkt|2034|gbl_tm_arch_name||+||S1|2928

```

#### # fep proc variables

```

pkt|2034|gbl_fep_error||+||s1|3952
pkt|2034|gbl_fep RAIDstat||+||s1|4052
pkt|2034|gbl_fep_id||+||u1|4152
pkt|2034|gbl_fep_mode||+||u1|4153
pkt|2034|gbl_fep_act_aos||+||time42|4154
pkt|2034|gbl_fep_exp_aos||+||time42|4160
pkt|2034|gbl_fep_act_los||+||time42|4166
pkt|2034|gbl_fep_exp_los||+||time42|4172

```

```

map|2035|+|itos_fep|||gbl_fep_time|"Front-end processor status and statistics"
pkt|2035|gbl_fep_time||+||time44|6||gbl_fep_epoch

```

#### # frame sync statistics

```

pkt|2035|gbl_frmsync_stat||+||u1234|16
pkt|2035|gbl_frmsync_cnt||+||u1234|20
pkt|2035|gbl_frmsync_drop||+||u1234|24

```

```

pkt|2035|gbl_frmsync_overrun||+||u1234|28
pkt|2035|gbl_frmsync_fps||+||f1234|32
pkt|2035|gbl_frmsync_bytes||+||f12345678|36
pkt|2035|gbl_frmsync_sbytes||+||f12345678|44
pkt|2035|gbl_frmsync_chan||+||u1234|52
pkt|2035|gbl_frmsync_inv||+||u1234|56

```

```
frame_sorter statistics
```

```

pkt|2035|gbl_tm_frmrate||+||f12345678|60
pkt|2035|gbl_tm_mc_fc||+||u1234|68
pkt|2035|gbl_tm_mc_in||+||u1234|72
pkt|2035|gbl_tm_mc_rej||+||u1234|76
pkt|2035|gbl_tm_mc_idle||+||u1234|80
pkt|2035|gbl_tm_mc_vere||+||u1234|84
pkt|2035|gbl_tm_mc_side||+||u1234|88
pkt|2035|gbl_tm_mc_seqe||+||u1234|92
pkt|2035|gbl_tm_mc_crce||+||u1234|96
pkt|2035|gbl_tm_mc_rse||+||u1234|100
pkt|2035|gbl_tm_mc_rsc||+||u1234|104
pkt|2035|gbl_tm_vc_fc||+||u1234|108
pkt|2035|gbl_tm_vc_in||+||u1234|364
pkt|2035|gbl_tm_vc_rej||+||u1234|620
pkt|2035|gbl_tm_vc_idle||+||u1234|876
pkt|2035|gbl_tm_vc_vere||+||u1234|1132
pkt|2035|gbl_tm_vc_side||+||u1234|1388
pkt|2035|gbl_tm_vc_seqe||+||u1234|1644
pkt|2035|gbl_tm_vc_crce||+||u1234|1900
pkt|2035|gbl_tm_vc_rse||+||u1234|2156
pkt|2035|gbl_tm_vc_rsc||+||u1234|2412
pkt|2035|gbl_tm_arch_free||+||u1234|2668
pkt|2035|gbl_tm_arch_frms||+||u1234|2672
pkt|2035|gbl_tm_arch_name||+||S1|2928

```

```
fep proc variables
```

```

pkt|2035|gbl_fep_error||+||s1|3952
pkt|2035|gbl_fep_raidstat||+||s1|4052
pkt|2035|gbl_fep_id||+||u1|4152
pkt|2035|gbl_fep_mode||+||u1|4153
pkt|2035|gbl_fep_act_aos||+||time42|4154
pkt|2035|gbl_fep_exp_aos||+||time42|4160
pkt|2035|gbl_fep_act_los||+||time42|4166
pkt|2035|gbl_fep_exp_los||+||time42|4172

```

```

map|2036|+|itos_fep|||gbl_fep_time|"Front-end processor status and statistics"
pkt|2036|gbl_fep_time||+||time44|6||gbl_fep_epoch

frame sync statistics

pkt|2036|gbl_frmsync_stat||+||u1234|16
pkt|2036|gbl_frmsync_cnt||+||u1234|20
pkt|2036|gbl_frmsync_drop||+||u1234|24
pkt|2036|gbl_frmsync_overrun||+||u1234|28
pkt|2036|gbl_frmsync_fps||+||f1234|32
pkt|2036|gbl_frmsync_bytes||+||f12345678|36
pkt|2036|gbl_frmsync_sbytes||+||f12345678|44
pkt|2036|gbl_frmsync_chan||+||u1234|52
pkt|2036|gbl_frmsync_inv||+||u1234|56

frame_sorter statistics

pkt|2036|gbl_tm_frmrate||+||f12345678|60
pkt|2036|gbl_tm_mc_fc||+||u1234|68
pkt|2036|gbl_tm_mc_in||+||u1234|72
pkt|2036|gbl_tm_mc_rej||+||u1234|76
pkt|2036|gbl_tm_mc_idle||+||u1234|80
pkt|2036|gbl_tm_mc_vere||+||u1234|84
pkt|2036|gbl_tm_mc_side||+||u1234|88
pkt|2036|gbl_tm_mc_seqe||+||u1234|92
pkt|2036|gbl_tm_mc_crce||+||u1234|96
pkt|2036|gbl_tm_mc_rse||+||u1234|100
pkt|2036|gbl_tm_mc_rsc||+||u1234|104
pkt|2036|gbl_tm_vc_fc||+||u1234|108
pkt|2036|gbl_tm_vc_in||+||u1234|364
pkt|2036|gbl_tm_vc_rej||+||u1234|620
pkt|2036|gbl_tm_vc_idle||+||u1234|876
pkt|2036|gbl_tm_vc_vere||+||u1234|1132
pkt|2036|gbl_tm_vc_side||+||u1234|1388
pkt|2036|gbl_tm_vc_seqe||+||u1234|1644
pkt|2036|gbl_tm_vc_crce||+||u1234|1900
pkt|2036|gbl_tm_vc_rse||+||u1234|2156
pkt|2036|gbl_tm_vc_rsc||+||u1234|2412
pkt|2036|gbl_tm_arch_free||+||u1234|2668
pkt|2036|gbl_tm_arch_frms||+||u1234|2672
pkt|2036|gbl_tm_arch_name||+||S1|2928

fep proc variables

pkt|2036|gbl_fep_error||+||s1|3952
pkt|2036|gbl_fep_raidstat||+||s1|4052
pkt|2036|gbl_fep_id||+||u1|4152

```

```
pkt|2036|gbl_fep_mode||+||u1|4153
pkt|2036|gbl_fep_act_aos||+||time42|4154
pkt|2036|gbl_fep_exp_aos||+||time42|4160
pkt|2036|gbl_fep_act_los||+||time42|4166
pkt|2036|gbl_fep_exp_los||+||time42|4172
```

### C.3 MOC FEP Status Mnemonics/Packets

The following are sample database definition files that can be used by the MOC to decommutate the 6 status packets from the 6 GFEP computers.

- MOC FEP Status Mnemonics/Packets
- MOC FEP Packet Maps [pdf ps]
- MOC FEP Mnemonics [pdf ps]

# Table of Contents

<b>Glast Front End Processor Overview .....</b>	<b>1</b>
<b>1 Introduction.....</b>	<b>2</b>
<b>2 Configuring the GFEP .....</b>	<b>3</b>
2.1 Supplied Media .....	3
2.2 Bios Setup.....	3
2.3 Adaptec Raid Setup .....	4
2.4 RedHat EL3 Install.....	4
2.5 First RedHat boot .....	4
2.6 Install Additional Root Packages .....	5
2.7 Install FastCopy 2.6 .....	6
2.8 Security Banners.....	7
2.9 Network Setup .....	7
2.10 System Services .....	8
2.11 Miscellaneous '/etc' files .....	9
2.12 SSH Modifications .....	10
2.13 Create User Accounts .....	11
2.14 RAID Utilities Install .....	12
2.15 EDT Driver/Software Install .....	12
2.16 ITOS Install.....	13
2.17 GFEP Home Directory Install.....	13
2.18 GFEP User KDE Configure .....	14
<b>3 Running the GFEP .....</b>	<b>17</b>
3.1 Normal Operations .....	17
3.2 Local Maintenance & Reconfiguration.....	17
3.2.1 Local System Maintenance .....	18
3.2.2 Local Enable Spare GFEP for Operation .....	19
3.2.3 Local Disable a GFEP from Operation .....	20
3.2.4 Local Changing a GFEP Operating Mode .....	21
3.3 Remote Maintenance & Reconfiguration .....	23
3.3.1 System Maintenance.....	23
3.3.2 Enable Spare GFEP for Operation .....	24
3.3.3 Disable a GFEP for Operation.....	25
3.3.4 Changing a GFEP Operating Mode.....	26
3.3.5 Manual Network Change GUI .....	27
<b>4 Troubleshooting .....</b>	<b>28</b>

## Appendix A GFEP System Files supplied . . . . 29

A.1	Floppy Kickstart Configuration file 'ks.cfg' . . . . .	29
A.2	"Message of the Day" file '/etc/motd' . . . . .	30
A.3	SU root allow file '/etc/sudoers' . . . . .	30
A.4	Kernel System Control file '/etc/sysctl.conf' . . . . .	31
A.5	FASTCopy flogic daemon file '/etc/init.d/flogicd' . . . . .	32
A.6	EDT Additional files . . . . .	33
A.7	Daily Cron Jobs . . . . .	33
A.8	Ipfiler Configuration file '/etc/sysconfig/iptables' . . . . .	34
A.9	Network Devices/Profiles . . . . .	35
	A.9.1 Devices directory . . . . .	35
	A.9.2 Profiles directory . . . . .	36

## Appendix B GFEP User Files . . . . . 39

B.1	gfep directory . . . . .	39
	B.1.1 Bash Initialization file . . . . .	39
	B.1.2 Bash Profile file . . . . .	39
	B.1.3 Bash Logout file . . . . .	40
	B.1.4 Network Initialization file . . . . .	40
	B.1.5 Xdefaults Customization file . . . . .	40
	B.1.6 ITOS Runtime Configuration script . . . . .	41
	B.1.6.1 GFEP 1 RTE itosrc . . . . .	41
	B.1.6.2 GFEP 2 PBE itosrc . . . . .	43
	B.1.6.3 GFEP 3 RTE itosrc . . . . .	45
	B.1.6.4 GFEP 3 PBE itosrc . . . . .	47
	B.1.6.5 GFEP 4 RTE itosrc . . . . .	49
	B.1.6.6 GFEP 5 PBE itosrc . . . . .	50
	B.1.6.7 GFEP 6 RTE itosrc . . . . .	52
	B.1.6.8 GFEP 6 PBE itosrc . . . . .	54
	B.1.7 ITOS database build script . . . . .	56
	B.1.8 syncit program . . . . .	56
	B.1.9 check script . . . . .	56
	B.1.10 checkit script . . . . .	56
	B.1.11 syncall script . . . . .	57
	B.1.12 syncstrip script . . . . .	57
	B.1.13 verify script . . . . .	57
B.2	gfep/dbx directory . . . . .	57
B.3	gfep/odb directory . . . . .	59
B.4	gfep/output directory . . . . .	59
B.5	gfep/pages directory . . . . .	59
B.6	gfep/procs directory . . . . .	63

<b>Appendix C</b>	<b>GFEP Runtime Variables</b>	<b>64</b>
C.1	Shell Environments Variables, STOL Variables and Mnemonics	64
C.2	GFEP Mnemonics and Packet definitions	67
C.3	MOC FEP Status Mnemonics/Packets	82